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PRINCIPLES OF SECONDARY EDUCATION

BY

ALEXANDER INGLIS
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PREFACE

In this book the author has attempted to make a systematic analysis of the factors and principles involved in a constructive theory of secondary education. The theory herein developed is the outgrowth of the writer's experience in secondary-school teaching and administration, together with his experience as a college instructor in the theory and practice of secondary education. The present volume presents the content and method employed in a course of the Principles of Secondary Education at Harvard University. After use in manuscript form for several years, the book is now published in the hope that it may prove of some value to teachers, administrators, and other students of education.

Three factors must always determine the form which secondary education should assume: (*a*) the nature of the pupils to be educated; (*b*) the character of the social organization and of social ideals; (*c*) the means and materials available for educational purposes. Accordingly this volume is divided into three parts. Part I is devoted to a consideration of the raw material with which secondary education deals, i.e., boys and girls approximately twelve to eighteen years of age. Part II is devoted to a consideration of the secondary school as a social institution — its character, place, and function. Part III is devoted to a consideration of the means and materials wherewith the aims of secondary education can be achieved. Throughout it has been the endeavor of the author to coördinate and correlate the various portions of the book in such a way as to develop a theory of secondary education in which the several elements are organically related and mutually consistent. For

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that reason each succeeding chapter or topic must be considered in its relation to the principles formulated or the factors treated in preceding sections. The complex interrelations of secondary education preclude the adequate consideration of any single phase in isolation.

In the construction of a book on the principles of secondary education one of two methods may be employed. A number of specialists may collaborate in the production of a book which consists of several more or less isolated treatises on various separate phases of secondary education. Such a method has many merits, but precludes the development of a consistently constructive theory. On the other hand, when a single individual attempts to write a book covering a field as broad as that of secondary education, there are always two possible dangers: either the limitations of the individual may lead to superficial treatment and error, or unsupported personal opinion and bias may dominate. The first of these dangers is minimized when the writer refrains from attempting to deal with the details of teaching appropriate to the various studies of the secondary-school program and confines this attention to more fundamental principles. In this book the author deals with special studies only in connection with the broader matters of aims and values, together with the larger elements of method necessarily involved. A later volume in this series will deal with the principles of teaching in the secondary school and several volumes will deal with methods of teaching special subjects or groups of subjects.

Bias and personal opinion the author has attempted to minimize in three ways: first, by supporting important statements on disputed points by reference to the opinions of specialists and to the results of impersonal investigation; secondly, by presenting directly the findings or theories of specialists and limiting his personal judgment to their evaluation in synthesis; thirdly, by securing the direct criticism of specialists and utilizing their judgments in the preparation of the book. Practically every chapter of the book has been examined and criticized by two or more specialists in the field treated in that chapter. In this way the author has hoped to safeguard himself and his readers from the errors of purely personal opinion and bias.

The mere listing of the names of those men and women who have assisted in the preparation of this volume would take more space than is here available. The author takes this opportunity to express to those persons collectively his deep appreciation of their assistance. Here also he wishes to acknowledge the courtesy of publishers and authors who have permitted the use of quotations for the clearer presentation of typical opinions on important points.

ALEXANDER INGLIS.

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PRINCIPLES OF SECONDARY EDUCATION

PART I

THE PUPILS

PRINCIPLES OF SECONDARY EDUCATION

CHAPTER I

THE SECONDARY-SCHOOL PUPIL: PHYSICAL TRAITS

1. Physical traits as basic data. All educational theory and practice must be determined primarily by the nature of the individuals to be educated. Reduced to its lowest terms education is the process of producing, directing, and preventing changes in human beings. For the intelligent production, direction, and prevention of such changes a knowledge of the raw material with which education deals is a fundamental necessity, and hence the first problem of educational theory and practice in any department is concerned with the nature of those to be educated. It is, perhaps, a platitude to say that the physical and physiological traits of the individual primarily condition his total nature. As is the case with many general truths, the readiness with which one accepts such a statement sometimes tends to interfere with a full appreciation of its significance and to leave one content with the acceptance of the generalization. The resulting tendency to minimize the importance of a knowledge of the physical and physiological traits of the educand is furthered by recognition of the fact that such traits are amenable to control through education to a limited degree only and that the demands of modern life emphasize attention to the phenomena of mental traits.

Secondary education, as any other department of education, demands for initial consideration the physical and physiological traits of boys and girls, special interest centering on those traits and their development in boys and girls of ages approximately twelve to eighteen. Out of the character of those traits and their development arise numerous important problems for secondary education, some of general and indirect importance, others of very specific and direct bearing. The present chapter, therefore, is concerned with the nature of physical or physiological traits in boys and girls, their development, and their bearing on the theory and practice of secondary education.

Before approaching the material presented in this chapter the reader should be warned that much remains to be accomplished in the measurement of physical and physiological traits and that even the best material available is open to severe criticism. In particular one must be careful not to infer too much from averages which can hold true for large groups only and cannot be applied safely to individuals or small groups because of the great variability found. Likewise one should be on guard against unqualified acceptance of the results of one or a few limited investigations. Finally, one must be aware of the danger of inferring the nature of development "in general," or the nature of the development of all organs and parts of the body, from the nature of the development of one or more specific parts or organs.

Two errors have been so common in the measurement of physical and physiological traits that they merit special mention. One of those errors is the practice of attempting to determine norms of development by measuring different groups of children at various ages, instead of measuring the growth of the same children. The second error is that of failing to recognize properly the importance of variability and of overemphasizing the importance of averages in the measurement of any given trait. Recent investigations have tended to avoid these errors.

2. The chronological ages of pupils. Data concerning physical traits and their development are best understood when referred to terms of maturity or "age." Ordinarily maturity or age is expressed in chronological terms — years, months, and days — and "norms" for physical and mental traits are commonly expressed by the layman and educator in such terms. However, chronological age is a very unsatisfactory measure of maturity and is likely to be misleading.

The organization of the American school system at present postulates that the age and grade distribution of pupils will conform roughly to the following standard:

Table I

	Elementary School								*Secondary School*			
Grade: . . .	1	2	3	4	5	6	7	8	I	II	III	IV
Age:	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18

That the actual situation is far from this age-grade distribution may be seen from the following typical example:

Table II. Age-Grade Distribution of Pupils in the Paterson (N.J.) Schools, 1912

Age	*Grades*												
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*I*	*II*	*III*	*IV*	*Total*
4	39	...	...	...	...	...	...	...	...	...	...	...	39
5	712	11	...	...	...	...	...	...	...	...	...	...	723
6	1239	367	16	...	...	...	...	...	...	...	...	...	1622
7	628	965	364	15	1	...	...	...	...	...	...	...	1973
8	154	584	943	270	20	1	...	...	...	...	...	...	1972
9	55	219	644	680	280	17	...	...	...	...	...	...	1895
10	23	102	294	602	617	254	5	...	...	...	...	...	1897
11	13	37	137	364	502	518	172	28	2	...	...	...	1773
12	9	22	61	210	356	560	489	152	25	...	...	...	1884
13	5	13	36	93	193	323	523	400	151	19	1	...	1757
14	2	3	8	26	60	124	234	366	286	88	17	...	1214
15	...	...	...	2	8	19	74	182	156	159	81	10	691
16	...	...	...	...	3	5	8	29	47	96	116	60	364
17	...	...	...	1	...	...	1	1	10	38	87	95	233
18	...	...	...	...	...	...	...	...	3	10	26	44	83
19	...	...	...	...	...	...	...	...	1	1	4	14	20
20	...	...	...	...	...	...	...	...	...	...	3	6	9
Over 20	...	...	...	...	...	...	...	...	...	...	3	3	6
Total	2879	2323	2503	2263	2040	1821	1506	1158	681	411	338	232	18155

From such a table as this a number of important facts regarding the chronological age of secondary-school pupils are evident. It is probable that in our schools as at present administered one will not find as many as one half of the pupils in any grade belonging to any single age group. Thus in the above table the largest age group in the eighth grade is the group of thirteen-year-old pupils who form 34.6 per cent of the entire grade group. In the first year of the high school the fourteen-year-old pupils constitute 42.0 per cent of the entire grade group. In the second year of the high school the fifteen-year-old pupils constitute 38.7 per cent of the entire grade group. In the third year of the high school the sixteen-year-old pupils constitute 34.3 per cent of the grade group. In the fourth year of the high school the seventeen-year-old pupils constitute 34.3 per cent of the grade group. Further, it is to be noted that until the factor of selection operates strongly in the later years of the secondary school the proportion of pupils belonging to any age group which is found in any single grade of the school rarely is as great as one-third of the entire age group found in the entire school system. This is seen clearly from the figures presented in Table III.

Consideration of such a typical situation as that indicated in the tables given shows clearly that chronological age is a very poor measure of maturity for educational purposes and that the actual existing situation in our educational system does not even approximately conform to the theoretical distribution of age and grade. Hence it is that the term "pedagogical age" is frequently employed to denote degrees of maturity as measured by the stages of educational progress (school grades) reached. It is obvious, however, that pedagogical age is a general term designed largely to eliminate the confusion caused by the use of chronological age as a measure of maturity and that it depends for real meaning

TABLE III. PERCENTAGES OF PUPILS OF DIFFERENT AGE GROUPS LOCATED IN VARIOUS GRADES OF THE SCHOOLS OF SIX CITIES. THE TOTAL NUMBER OF PUPILS CONSIDERED WAS APPROXIMATELY 35,000*

Grades	*Age in years*					
	12	*13*	*14*	*15*	*16*	*17*
1	0.7%	0.2%	0.2%	0.2%	0.2%	0.1%
2	1.9	0.8	0.4	0.1	0.1	0.1
3	5.8	2.8	1.5	0.6	0.4	0.0
4	11.7	6.7	3.4	2.0	0.6	0.1
5	22.1	13.2	7.1	3.3	1.4	0.3
6	*28.2*	21.5	12.2	6.6	1.9	0.8
7	21.6	*27.5*	21.3	12.7	5.8	1.7
8	7.0	19.8	*28.5*	19.6	12.6	4.6
I	0.9	6.4	15.9	*27.5*	20.7	10.9
II	0.1	1.0	8.7	22.0	*31.0*	26.6
III	0.0	0.0	0.8	4.8	19.4	*27.9*
IV	0.0	0.0	0.0	0.6	5.9	*27.0*

* Inglis, A. J. "A Fundamental Problem in the Reorganization of the High School," *School Review*, vol. XXIII, p. 316.

on more fundamental measures of the two underlying and correlated factors, physical and mental maturity. Thus we have at least four measures of maturity: chronological age, pedagogical age, physiological age, and psychological age. By chronological age is meant the number of years and months a boy or girl has lived. By pedagogical age is meant the grade which he has reached in school or the stage of his educational progress. By physiological age is meant the degree of maturity which he has reached as measured by the development of various organs and parts of the body, or of the body as a whole. It is sometimes restricted in its application to stages of pubescence and adolescence. By psychological or mental age is meant the degree of maturity which the boy or girl has reached as measured by the development of mental traits. That chronological age is by no means parallel with pedagogical age has been suggested above. That it is not closely paralleled by physiological age or by psychological age is a matter of everyday observation. A boy sixteen years of age may be less mature physiologically and mentally than another boy twelve years of age.

The consideration of physiological age is the special purpose of this chapter. The consideration of psychological age, together with problems of the relation between psychological age and other "ages," is the special purpose of Chapter II.

3. The growth of children in height and weight. The phenomena of growth in height and weight are probably the most easily observed and readily measured phenomena affording information concerning the physical growth of children and hence they have received the most attention. Numerous studies afford valuable data regarding the height and weight of children at various chronological ages. For the present purpose we may consider the figures calculated by Boas from data concerning 88,449 American school children in height and about 68,000 in weight. (Tables IV–V.)

From these two tables a number of facts may be deduced: (1) The rate of growth in height and weight as measured by the per cent of annual increase varies at different periods and between the sexes. (2) For boys the rate of growth in height is relatively high (average per year 5.4 per cent) from age 5.5 to age 8.5, is relatively low (average per year 3.25 per cent) from age 8.5 to age 12.5, and is relatively high again (average per year 4 per cent) from age 12.5 to age 16.5 where the limit of average height for adults (about 68 inches) is approached. (3) For boys the rate of growth in weight is relatively high (average per year 9.8 per cent) from age 6.5 to age 8.5, is relatively low (average per year 8.95 per cent) from age 8.5 to age 12.5, and is relatively high again (average per year 12 per cent) from age 12.5 to age 16.5. (4) For girls the rate of growth in height remains relatively constant from

TABLE IV. AVERAGE HEIGHT OF 45,151 BOYS AND 43,298 GIRLS IN THE SCHOOLS OF CERTAIN AMERICAN CITIES, WITH MEASURES OF INCREASE AND VARIABILITY*

Average age in years	*Boys*				*Girls*			
	Average height (inches)	*Mean variation (inches)*	*Average annual increase*		*Average height (inches)*	*Mean variation (inches)*	*Average annual increase*	
			Inches	*Per cent*			*Inches*	*Per cent*
5.5	41.7	1.7			41.3	. . .		
			2.2	5.3			2.0	4.8
6.5	43.9	1.8			43.3	1.9		
			2.1	4.8			2.4	5.5
7.5	46.0	2.0			45.7	2.0		
			2.8	6.1			2.0	4.4
8.5	48.8	2.1			47.7	2.2		
			1.2	2.5			2.0	4.2
9.5	50.0	2.2			49.7	2.2		
			1.9	3.8			2.0	4.0
10.5	51.9	2.3			51.7	2.4		
			1.7	3.3			2.1	4.1
11.5	53.6	2.4			53.8	2.6		
			1.8	3.4			2.3	4.3
12.5	55.4	2.6			56.1	2.9		
			2.1	3.8			2.4	4.3
13.5	57.5	3.0			58.5	2.8		
			2.5	4.3			1.9	3.2
14.5	60.0	3.3			60.4	2.6		
			2.9	4.8			1.2	2.0
15.5	62.9	3.4			61.6	2.3		
			2.0	3.2			0.6	1.0
16.5	64.9	3.0			62.2	2.2		
			1.6	2.5			0.5	0.8
17.5	66.5	2.8			62.7	. . .		
			0.9	1.4			. . .	. . .
18.5	67.4	. . .			. . .	. . .		

* Burk, F., "Growth of Children in Height and Weight," *American Journal of Psychology*, vol. IX, p. 262. Figures after Boas, F., *Report of the United States Commissioner of Education (1896–97)*, vol. II, pp. 1541–99. Measurements were made on different groups of children for the several ages.

age 7.5 to age 13.5 where the average adult limit begins to be approached. (5) For girls the rate of growth in weight is relatively high (average per year 10 per cent) from age 6.5 to age 8.5, is relatively low (average per year 9.5 per cent) from age 8.5 to age 10.5, and is relatively high (average per year 12 per cent) from age 10.5 to age 14.5. (6) Boys excel girls in height from birth up to age about 11.5 and after about 14.5. In weight they excel girls from birth up to

TABLE V. AVERAGE WEIGHT OF ABOUT 68,000 AMERICAN CHILDREN IN CERTAIN CITIES, WITH THE ANNUAL INCREASES*

Average age in years	*Boys*			*Girls*		
	Average for each age (pounds)	*Absolute annual increase (pounds)*	*Annual increase (per cent)*	*Average for each age (pounds)*	*Absolute annual increase (pounds)*	*Annual increase (per cent)*
6.5	45.2	4.3	9.5	43.4	4.3	9.9
7.5	49.5	5.0	10.1	47.7	4.8	10.0
8.5	54.5	5.1	9.3	52.5	4.9	9.3
9.5	59.6	5.8	9.7	57.4	5.5	9.6
10.5	65.4	5.3	8.1	62.9	6.6	10.5
11.5	70.7	6.2	8.7	69.5	9.2	13.2
12.5	76.9	7.9	10.3	78.7	10.0	12.7
13.5	84.8	10.4	12.3	88.7	9.6	11.9
14.5	95.2	12.2	12.8	98.3	8.4	8.5
15.5	107.4	13.6	12.7	106.7	5.6	5.2
16.5	121.0			112.3	3.1	2.8
17.5	...	...	...	115.4	...	...
18.5	...	...	...	114.9		

* From Burk, F. (after Boas), *op. cit.*, p. 263.

about age 12.5 and after about 15.5. For a period of about three years around the age of puberty and early adolescence girls excel boys in height and weight. They tend to mature earlier. (7) For girls and boys the mean variation in height from age 8.5 on is at every age greater than the amount of the average annual increase. This fact illustrates very clearly the danger of applying general averages to individual cases or to small groups. "Each individual is a law unto himself. A school child may be several inches shorter and many pounds lighter than the average for children of his age, race, and sex, while fully reaching the standard which nature set for *him*."[1] Even when we are dealing with large groups the amount of the variability must be considered just as important as the average. This is shown for height in the following table:

TABLE VI. SHOWING THE FREQUENCIES OF HEIGHTS OF AMERICAN BOYS AND GIRLS OF AGES FROM 11.5 TO 16.5 YEARS. FREQUENCIES IN PER CENTS OF TOTAL AGE GROUPS *

Height in centimeters	*Boys: age in years*						*Girls: age in years*					
	11.5	*12.5*	*13.5*	*14.5*	*15.5*	*16.5*	*11.5*	*12.5*	*13.5*	*14.5*	*15.5*	*16.5*
109–112	0.2	...	...	...	...	...	...	...	...	...	...	...
113–116	0.2	...	...	...	...	...	0.3	0.2	...	...	...	...
117–120	0.4	0.1	0.1	...	...	...	0.6	0.2	0.2	...	...	...
121–124	2.5	0.7	0.3	0.2	0.1	...	3.1	0.7	0.2	...	...	...
125–128	9.1	2.7	0.9	0.3	...	...	8.6	2.1	0.3	0.2	...	...
129–132	18.1	8.8	2.6	0.6	...	...	18.0	6.5	1.2	0.3	...	...
133–136	25.5	18.2	7.6	2.0	0.4	...	23.4	13.1	3.9	1.0	...	...
137–140	22.3	23.3	14.9	6.1	1.1	0.5	20.8	19.5	10.0	2.6	0.9	0.2
141–144	13.9	21.2	20.9	10.8	4.4	1.1	14.3	21.7	14.3	6.1	2.2	1.0
145–148	5.3	13.6	19.8	17.1	7.4	1.5	6.8	16.2	20.1	12.6	6.4	4.6
149–152	1.9	7.0	14.9	18.2	13.4	5.1	3.1	11.0	21.7	22.6	18.0	13.6
153–156	0.4	3.0	10.2	17.1	15.4	7.6	0.7	5.8	16.0	26.2	27.4	23.9
157–160	0.2	1.1	4.8	11.9	16.8	13.8	0.3	2.4	8.3	16.7	23.0	26.5
161–164	...	0.3	1.8	8.4	14.7	18.9	...	0.4	3.0	8.1	14.8	18.6
165–168	...	...	0.6	3.9	12.9	20.3	...	0.2	0.6	2.7	5.7	8.7
169–172	...	...	0.4	2.3	8.0	19.1	...	...	0.2	0.7	1.2	2.6
173–176	...	...	...	0.7	3.1	7.5	...	...	...	0.2	0.4	0.2
177–180	...	...	...	0.3	1.0	3.9	...	...	...	...	...	0.1
181–184	...	...	...	...	0.1	0.6	...	...	...	...	...	...
185–188	...	...	...	...	...	0.1	...	...	...	...	...	...

* Adapted from Burk, F. (after Boas), *op. cit.*, pp. 265–66.

The figures in this table indicate clearly the danger of relying on averages. This is obvious from the extensive range in height between the smallest boy or girl of any given age and the tallest of the same age (averaging nearly a foot and a half), from the great amount of variation in each age group, and from the great amount of overlapping. In general it may be said that the average height for a boy or girl of any chronological age from 11.5 to 18.5 is equalled or surpassed by the height of more than twenty per cent of the boys or girls a year younger.

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[1] Terman, L. M., *The Hygiene of the School Child*, p. 21.

The variability in height and weight has been made the basis of several investigations designed to discover what relation, if any, exists between physical growth and mental ability. Are children who are heavier and taller than their fellows of the same chronological age more or less mature mentally than the latter, or is there no relation between physical growth (as measured by height and weight) and mental ability? Porter maintained that there is a physical basis for precocity and dullness, with the advantage in favor of those physically more mature. He bases his argument primarily on data collected and compiled by himself for the heights and weights of about 34,500 boys and girls as related to their pedagogical progress. While his figures apply particularly to elementary-school pupils the point which he raises may be made clear through the presentation of data for pupils fourteen to sixteen years of age. (Table VII.)

Porter says: "The truth which the [original] table expresses is very plain. It declares in unmistakable lines that precocious children are heavier and dull children lighter than the mean child of the same age. It establishes a physical basis of precocity and dullness." Boas calls attention to the fact, however, that the figures show a correlation between mental and physical growth but not necessarily that mental development depends on physical growth. West further notes that two errors are involved in Porter's results because a number of pupils enter school at a late age and are therefore incorrectly counted as "dull" pupils, and because Porter's results are capable of misinterpretation through his method of reckoning age according to the nearest birthday.[1]

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[1] West, G. M., *Science*, vol. IV, pp. 156–59.

TABLE VII. SHOWING THE RELATION OF SCHOOL PROGRESS TO WEIGHT AS INDICATED BY THE DISTRIBUTION OF HEAVY AND LIGHT CHILDREN OF THE SAME AGES IN DIFFERENT GRADES OF THE ST. LOUIS SCHOOLS*

Age at nearest birthday		*Mean weight (pounds)*	*Average weight of children in grades*						
			Elementary school						*High School*
			3	*4*	*5*	*6*	*7*	*8*	
14	Boys	88.08	81.00	84.00	87.83	87.20	93.63	97.50	86.50
	Girls	93.94	90.50	87.17	92.67	94.64	95.15	99.00	103.12
15	Boys	100.20	—	89.00	95.33	99.17	105.50	105.17	105.08
	Girls	103.20	—	98.50	100.95	99.83	104.00	104.58	105.15
16	Boys	114.17	—	—	—	114.50	104.00	114.00	123.00
	Girls	110.06	—	—	—	108.12	107.38	110.29	113.37

* Adapted from Burk, F. (after Porter), *op. cit.*, pp. 296–97.

Boas, using data collected by West at Toronto, made a comparison of the relative brightness of children and their stages of physical development in weight.[1] The results which he obtained were diametrically opposed to those found by Porter, though his results cannot be accepted as satisfactorily obtained because of methods employed in determining the "brightness" of pupils on the basis of teachers' judgments. MacDonald,[2] using the teachers' estimates of "brightness," and Smedley,[3] using age and grade progress as measures, found that "bright" children were taller and heavier than "dull" children. Baldwin[4] distinguishes between "precocity" and advanced stages of mental maturation, and, basing his conclusions on the school grades and physical growth measured in the same children at different ages, states that tall children are older physiologically and more mature mentally, though frequently not as bright. Gilbert[1] claims a lack of correlation. The conflicting conclusions reached by the different investigators render the problem complex. However, the consensus of opinion that feeble-minded children are commonly inferior in height and weight could lend support to the theory that there is an important correlation between mental ability and physical growth in height and weight. Terman claims: "For masses, however, the relationship undoubtedly holds."[2] Porter's suggestion is not without importance that: "No child whose weight or height is below the average (median or norm) for its age should be permitted to enter a school grade beyond the average of its age except after such a physical examination as shall make it probable that the child's strength is equal to the strain."[3]

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[1] Boas, F., *Science*, vol. I, pp. 225–30.

[2] MacDonald, A., *Report of the United States Commissioner of Education* (1897–98), vol. I, pp. 989–1204; vol. II, pp. 1281–90.

[3] Smedley, F. W., *Report of the Department of Child Study of the Public Schools*, Chicago, vol. 2, pp. 10–48.

[4] Baldwin, B. T., *Physical Growth and School Progress*, pp. 89–90.

4. **The growth of organs and parts of the body.** It is sometimes thought that the process of growth throughout the body is essentially uniform and that the various organs and parts of the body develop at about the same rates and in about the same proportions at different stages. Such a conception is erroneous. Growth is relative in the various organs and parts of the body. Each organ and part has its own rate of development. After initial rapid development in babyhood some organs and parts develop at a fairly constant rate until the limits of growth are approached. Others develop rapidly in early childhood and more slowly later. Still others manifest a relatively rapid rate of development in

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[1] Gilbert, J. A., *Researches on School Children and College Students*, Studies from the Yale Psychological Laboratory, vol. I, pp. 1–39.

[2] Terman, L. M., *The Hygiene of the School Child*, pp. 27–29.

[3] Porter, W. T., *The Physical Basis of School Progress*, Transactions of the St. Louis Academy of Science, vol. 6, pp. 161–81.

early childhood, then a period of relatively slow development, followed again by a relatively rapid rate of development. The various organs and parts of the body which have been measured carefully in their development manifest widely varying rates of growth.[1] Growth in height and weight may be and probably is significant of activity in the growth processes of various organs and parts of the body whose rates of development vary widely from each other and from such total growth as can be measured by height and weight.

In the following table are presented figures for growth in vital capacity and in the circumference of the head.

TABLE VIII*

Age	*Vital capacity in cubic centimeters (Smedley)*				*Circumference of the head in millimeters (MacDonald)*			
	Boys		*Girls*		*Boys*		*Girls*	
	Norm	*Increase*	*Norm*	*Increase*	*Norm*	*Increase*	*Norm*	*Increase*
6	1023		950		513.6		506.2	
7	1168	14.2	1061	11.7	519.4	11.10	506.5	0.06
8	1316	12.7	1165	9.1	520.9	0.29	511.6	1.01
9	1469	11.6	1286	10.4	523.5	0.50	515.4	0.74
10	1603	9.1	1409	9.6	526.5	0.57	518.9	0.68
11	1732	8.0	1526	8.3	528.8	0.44	521.7	0.54
12	1883	8.7	1664	9.0	531.9	0.58	527.8	1.17
13	2108	12.0	1827	9.8	533.7	0.34	532.1	0.81
14	2395	13.6	2014	10.2	538.7	0.93	538.0	1.11
15	2697	12.6	2168	7.6	544.8	1.13	540.5	0.46
16	3120	15.7	2266	4.5	550.4	1.03	543.0	0.46
17	3483	11.3	2319	2.3	555.5	0.93	547.4	0.81
18	3655	4.9	2343	1.0	556.5	0.18	548.6	0.22

* Table adapted and increments derived by the writer from data given by Smedley, F. W., *Report of the Department of Child-Study*, Chicago, vol. 2, pp. 13–14, and from Whipple, G. M. (after MacDonald, A.), *Manual of Mental and Physical Tests*, Part I, pp. 88–89.

Hall claims that the lungs share in the augmented development of adolescence. Smedley claims that girls increase most rapidly in vital capacity from 12 to 14, after which the increment is at a diminished rate; that boys take a sudden start upward at 14, and continue a rapid rise until at least 19½; and that boys have a larger vital capacity than girls at all ages. Baldwin and Smedley claim that there is a positive correlation between vital capacity and school standing. Gilbert claims that there is no correlation.

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[1] Cf. Hall, G. S., *Adolescence;* and Weissenberg, S., *Das Wachstum des Menschen nach Alter.*

It is tempting to take the development of the skull as indicating a possible measurement of the development of the brain and nervous system. Such a theory is in all probability quite untenable, inasmuch as the development of the head in circumference is largely due to the growth of the bones of the skull and the weight of the brain does not increase in the same proportion as intelligence. The most appropriate analogy between the development of mental traits and physical traits would naturally be concerned with the development of the nervous system and especially of the brain. It is recognized, however, that the development of mental traits depends not so much on the increase of the brain in mass as measured by size or weight as on the development of neurone cells and their interconnections. On this our present knowledge sheds little light and inferences are dangerous. To argue for a parallelism of mental development and physical development by analogy, and then to argue that there is correspondence in the development of the nervous system following from the supposed development of mental traits, is to argue in a vicious circle. Concerning the development of the nervous system Terman's statements are here appropriate:

> Compared to the rest of the body, the central nervous system shows a precocious growth in size and weight. At birth the brain has already attained about one fourth of its final size, and by seven years over ninety per cent. Growth continues much retarded up to about fourteen, and then practically ceases. But here, least of

> all, does weight give any idea as to maturity. The cells of the brain, although all present in embryonic, granule form for several months preceding birth, only gradually ripen into their fully differentiated structure and put forth their branching network of dendrites. . . . The acquisition of the medullary sheath, which we have above spoken of as the ripening process, proceeds rapidly in the sensory centers and more gradually in the frontal portion, named by Flechsig the "association centers." This includes almost two thirds of the cerebral cortex, which together with the middle sheath of tangential fibers, shows remarkable and important changes in the cellular development of later adolescence, the changes continuing probably as late as forty years.[1]

Studies of the growth of the bones of the body have emphasized the variations in the development of parts of the body in two rather noteworthy respects. The researches of Rotch and Pryor indicate that anatomical development, as measured by stages in ossification, is largely independent of chronological age and of development in height or weight, except in the most general way. They further indicate that girls are more advanced than boys at every age with respect to the stage of ossification of the epiphyseal cartilage, though in height, weight, and possibly in vital capacity, such superiority on the part of girls is found only as previously indicated from about twelve to about fourteen.[2]

5. Physical development in relation to health. On the whole it appears probable that mortality is lowest and the capacity to resist disease highest at ages about ten to fourteen, or preceding and during the early stages of puberty. Accurate figures are difficult to secure and still more difficult to interpret. In 1910–11 for certain registration areas of the United States the uncorrected death rates for various age groups were as indicated in the following table:

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[1] Terman, L. M., *The Hygiene of the School Child*, pp. 57–58.

[2] *Ibid.*, pp. 62–63.

Table IX. Death-Rates per 1000 Population for Various Age Groups in 1910–11*

Age groups	*22 states*			*50 cities*		
	Male	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*
1– 4 years	12.2	11.3	11.8	15.3	13.9	14.6
5– 9 "	3.2	3.0	3.1	4.0	3.6	3.8
10–14 "	2.3	2.1	2.2	2.9	2.5	2.7
15–19 "	3.8	3.5	3.6	4.5	4.0	4.3
20–24 "	5.4	5.0	5.2	6.6	5.7	6.1

* Compiled by the writer from data given on pp. 16–17 of Department of Commerce, Bureau of the Census, *Mortality Statistics* (1911). Figures for cities are in terms of the average rates for fifty cities each of 100,000 population or over.

Hartwell's figures for death rates in the City of Boston were obtained more than twenty-five years ago. In terms of deaths per thousand for various ages they are indicated in the following table:

Table X*

Age	*Male*	*Female*	*Age*	*Male*	*Female*
4– 5	20.73	21.55	12–13	3.44	4.30
5– 6	14.85	16.44	13–14	4.18	6.17
6– 7	13.40	14.38	14–15	3.98	5.83
7– 8	9.35	9.62	15–16	5.31	5.89
8– 9	6.09	8.11	16–17	6.58	6.57
9–10	7.41	5.11	17–18	6.43	7.94
10–11	4.77	5.23	18–19	10.48	6.32
11–12	4.28	3.23	19–20	10.35	10.48

* Hartwell, E. M., *Report on Physical Education in the Boston Public Schools.*

Such figures as those presented in these two tables must be interpreted with great caution. The removal at early ages of those who are more susceptible to illness and death constantly makes each successive group more select in health so that the decrease in the death-rate from childhood to puberty may in no direct way be related to development with age. It is to be noted also that preventive medicine and improved hygiene tend to decrease the death-rate at early ages and tend to increase it at later ages. In this connection it may be mentioned that Hartwell found that the age of the minimum death-rate was the thirteenth year in 1875, the fourteenth year in 1885, and the fifteenth year in 1890.

It is frequently stated that the period of puberty and early adolescence is characterized by low mortality rates and a high resistance to diseases of a serious character, but by a susceptibility to minor illnesses. The evidence in all cases is by no means clear. Neither is it clear that a low rate of mortality, if it is found for puberty, is necessarily related to the phenomena of development. On the whole Terman's statements concerning investigations in this field are appropriate.[1]

> Investigations on this point are somewhat contradictory, but indicate on the whole that, although the mortality rate is lowest when the adolescent acceleration is greatest, morbid conditions of both mind and body are at that time most frequent. This is particularly true of girls. It is necessary, however, to discriminate diseases and to determine the curve of liability of each. To lump together diseases and complaints of every kind and to enumerate them as so many "illnesses" or "defects" is of doubtful value, at best, and may be misleading.

Many more and much more accurate investigations are necessary before we may, with any certainty, determine the relation of health to maturity or the phenomena of development.

6. The physiological phenomena of adolescence. "Adolescence" (from the Latin *adolescere* — *to grow up, to ma-*

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[1] Terman, L. M., *The Hygiene of the School Child*, p. 26.

ture) is the term applied to that stage of development of boys and girls between the approximate ages of twelve and twenty, when the procreative powers are developing. "Puberty" is the term applied to the initial stage of physiological development at adolescence.[1] From its beginning secondary education has been closely associated with the period of puberty and adolescence and in many ways its character has frequently been determined, directly or indirectly, by the physiological phenomena connected with that period of development. Thus among primitive peoples what formal education existed was related to the initiatory rites and ceremonies which took place at puberty or during adolescence. Among the Greeks the very terms employed to characterize certain forms or stages of education indicated the connection between education and puberty.[2] At the present time the period of secondary education either coincides with or is included in the period of puberty or early adolescence so that any fruitful analysis of physical or physiological development and of secondary education requires careful study of the phenomena of adolescence. Such an analysis is of great importance for the proper understanding and treatment of adolescent boys and girls in direct connection with the physical and physiological traits themselves. It becomes increasingly important in view of the correlation sometimes claimed between physiological and mental traits and in view of certain indirect effects of physical or physiological traits on mental traits through the determination of subjective attitudes.

If puberty began for all children or even for all boys or all girls at approximately the same chronological age, problems arising out of the phenomena of adolescence would be much less complicated than they are. The date of the onset of puberty varies both for boys and for girls. It varies according to race, according to climate, and according to many other conditions. Hence, from the mere fact of chronological age one cannot predicate that a child is immature, maturing, or already mature. This appears clearly from the results obtained by Crampton who measured 3825 boys in the high schools of New York City and classified them in three groups of the prepubescent (immature), pubescent (maturing), and postpubescent (mature).

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[1] In its strict sense puberty has reference to the growth of hair on the body.

[2] *Eirenic* and *ephebic* from εἴρην and ἔφεβος = *having attained the age of puberty*, from ἐπὶ = *at* and ἥβη = *puberty, the state of being marriageable.*

TABLE XI. DISTRIBUTION OF BOYS BY CHRONOLOGICAL AGE AND BY PHYSIOLOGICAL AGE AS MEASURED BY STAGES OF PUBESCENCE *

Mean age in years	*Prepubescent (immature)*	*Pubescent (maturing)*	*Postpubescent (mature)*
12.25	(81)%	(16)%	(2)%
12.75	69	25	6
13.25	55	26	18
13.75	41	28	31
14.25	26	28	46
14.75	16	24	60
15.25	9	20	70
15.75	5	10	85
16.25	2	4	93
16.75	1	4	95
17.25	0	2	98
17.75	0	0	100

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* Crampton, C. W., "Physiological Age — A Fundamental Principle," *American Physical Education Review*, vol. XIII, p. 150.

The change from prepubescence to pubescence is most noticeable from age 13.75 to age 14.25.

The other ages immediately preceding this, however, are also popular, and the average date is much earlier than the mean date. For the ending of prepubescence and the beginning of pubescence the middle of the mean year is 14.00 years, the average date is 13.44 years with a variability (mean square deviation) of 1.51 years.[1]

This means that it requires a range of about three years to include approximately two thirds of the cases. The full significance of this variability is noted by Crampton:

> If the immature differed from the mature in no other way than this particular sign, it would hardly be worth while to segregate these groups. The classification shows, however, that there is a striking physical change in the progress from immaturity to maturity. At characteristic ages, the mature are more than 33 per cent heavier, 10 per cent taller, and 33 per cent stronger than the immature.

To substantiate this statement he presents among others the following figures:

TABLE XII *

Age in years	*Average weight in kilograms*			*Average height in centimeters*			*Average strength of grip in kilograms*		
	Prepubescent	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*
12.75	25.2	36.6	(50.8)	144.0	147.5	150.5	26.6	28.2	(32.5)
13.25	35.0	37.2	44.3	144.2	148.7	153.9	26.3	28.1	33.6
13.75	35.4	37.9	43.8	145.7	150.4	155.9	27.6	30.4	35.2
14.25	35.2	38.6	45.4	146.6	150.6	157.9	27.3	30.2	37.8
14.75	36.8	39.0	47.2	147.3	151.7	158.9	29.4	30.8	38.3
15.25	37.9	38.8	47.7	149.8	151.5	160.7	29.6	31.1	40.1
15.75	36.7	41.8	49.3	149.8	153.1	162.6	32.5	30.4	42.9
16.25	(40.0)	38.3	51.6	151.0	152.4	164.6	31.7	29.6	43.8
16.75	(42.5)	(41.5)	53.5	(153.0)	(151.4)	165.4	(27.5)	33.2	48.3

* Crampton, C. W., "The Influence of Physiological Age on Scholarship," *The Psychological Clinic*, vol. I, pp. 117–18.

The correlation between stages of puberty and such physical traits as height and weight is indicated by these data. The correlation between physical development in height and weight and mental ability or school progress was considered in a preceding section. Crampton maintains:

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[1] Crampton, C. W., *op. cit.*, p. 146.

> Greater height, weight, and strength are related to better scholarship because they are all effects of the same cause, — earlier pubescence. . . . It is possible that if this factor were to be eliminated there would appear a minus instead of a plus relation between scholarship and weight.[1]

These statements he bases on the results obtained by comparing the average status in physical traits of boys of the same chronological age and the same physiological age groups which differed only in pedagogical age by one high-school term, and by observing the rate of success and failure of boys of each chronological age and physiological age group. Employing the latter method he found that postpubescents were more successful, eighteen per cent failing to pass into the next form as against twenty-seven per cent of failure for the prepubescents at thirteen years of age. At the age of fourteen the per cents of failure were twenty-four and thirty-four respectively; at fifteen they were twenty-nine and thirty-six. As a result he maintains that earlier pubescence favors good scholarship and later pubescence poorer scholarship.

Variability also characterizes the date of the appearance and development of pubescence among girls. This is shown in Table XIII.

From these figures the following conclusions may be drawn: (1) the date of the onset of puberty is highly variable for girls; (2) girls of the same chronological age differ widely with respect to their stages of physiological maturity as measured by puberty; (3) less than five per cent of girls are still prepubescent at the age of fifteen; (4) pubescence begins for girls earlier than for boys.

7. Some implications for secondary education. As a result

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[1] Crampton, C. W., *op. cit.*, pp. 118–19.

TABLE XIII. DISTRIBUTION OF 1241 GIRLS BY CHRONOLOGICAL AGE AND STAGES OF PUBERTY *

Mean age in years	*Prepubescent (immature)*	*Pubescent (maturing)*	*Postpubescen (mature)*
10.0	100.00%	0.00%	0.00%
10.5	93.75	6.25	0.00
11.0	100.00	0.00	0.00
11.5	78.84	19.23	1.92
12.0	62.06	37.93	0.00
12.5	58.20	23.88	17.91
13.0	39.53	34.88	25.58
13.5	15.15	37.87	46.96
14.0	15.38	38.46	46.15
14.5	4.83	17.74	77.42
15.0	0.00	14.54	85.45
15.5	1.55	7.81	90.62
16.0	2.04	6.12	91.83
16.5	0.00	3.17	96.83
17.0	0.00	0.00	100.00

* Baldwin, B. T., "A Measuring Scale for Physical Growth and Physiological Age," *Fifteenth Yearbook of the National Society for the Study of Education*, part I, chap. I, p. 17. The relatively small number of cases examined precludes any exact interpretation and explains some minor fluctuations. The general tendency is, however, obvious.

of his study of physiological age in connection with high-school pupils Crampton recommends:

> Where mature and immature children are now brought together in the same class in the elementary or high school, they should be separated into different classes, so that the pedagogical, ethical and social treatment to which they are subjected may be better adapted to their disparate and distinct requirements and abilities.[1]

An experiment carried on in a New York City high school more or less sustained Crampton's thesis. Foster, giving the results of that experiment, presents the following figures:

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[1] Crampton, C. W., "Anatomical or Physiological Age: *versus* Chronological Age," *Pedagogical Seminary*, vol. xv, p. 236.

TABLE XIV *

	Registered number	*Discharges (per cent)*	*Failures (per cent)*	*Promotions (per cent)*
Eight classes arranged by physiological age . .	295	20	19	61
Four classes not arranged by physiological age . .	149	31	17	52
Previous class not arranged by physiological age.	318	27	17	56

* Foster, W. L., "Physiological Age as a Basis for the Classification of Pupils entering High Schools," *Psychological Clinic*, vol. IV, p. 86.

From these and other results Foster drew the following conclusions:

> (1) It is more agreeable for boys of the same development to associate with one another. (2) A classification of high school students according to physiological age, based on pubescence, is easy and practical. (3) By an experiment in a New York City high school it was shown that the efficiency of the students was increased by such a classification. The percentage of discharges was very materially decreased (from 7 per cent to 11 per cent decrease). (4) This increased efficiency is due to pleasanter associations with students of the same development. (5) There exists a very close relationship between pubescence and height. (6) In schools where physical examination is impossible, a classification according to height would probably produce almost the same results.[1]

Such statements are dangerous when made on the basis of such limited investigations as those of Foster.

The classification suggested by Crampton and by Foster, however promising it may appear when considered apart from the exigencies of school administration, presents certain difficulties when considered in relation to the ordinary demands of administration in the secondary school. Any

[1] Foster, W. L., *op. cit.*, p. 88.

scheme of classification which increases the homogeneity of the groups to be taught in one direction without decreasing it in another may be considered a priori as a means of improving teaching and increasing the measure of success. Hence it is to be expected that where conditions permit the division of pupils in a given grade into groups roughly homogeneous with respect to the stages of physiological development (or any other important factor), better results may be looked for. In a large secondary school such a classification is frequently possible. In a small school, or even one of average size, such a subdivision of classes is impossible. Of the 11,674 public high schools in the United States in 1914-15 less than one tenth (990) were in cities of 8000 population or over and 10,684 were in communities of less than 8000 population each. In smaller communities the "average" high school has 62 pupils. The "average" high school for the country at large has about 114 pupils, distributed somewhat as follows: 47 (41 per cent) in the first-year class, 30 (27 per cent) in the second-year class, 21 (19 per cent) in the third-year class, and 16 (14 per cent) in the fourth-year class. It is obvious that in the great majority of public secondary schools it is impracticable to subdivide classes for the purpose of segregating boys or girls or both according to degrees of pubescence.

Far more practicable and far more justifiable is the suggestion of Baldwin:[1]

> Therefore, the obvious educational corollary is that our school systems, public and private, should take into careful consideration *the physiological age and the accompanying stages of mental maturity* of boys and girls, rather than the chronological age and brightness, as is now done. This would require that tall, healthy children of accelerated development be encouraged to proceed through school

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[1] Baldwin, B. T., "A Measuring Scale for Physical Growth and Physiological Age," *Fifteenth Yearbook of the National Society for the Study of Education,* part I, pp. 15–17.

as rapidly as possible within the limits of thoroughness, and that small, light children of retarded physiological development be kept below or in the normal grade, doing supplementary work, *since these short, light pupils are immature in mental development, although in many cases precocious in degree of brightness.*

Incomplete though our knowledge of physiological age is, it is sufficient to put us on guard against the practice of ignoring it as a factor of importance in school organization and administration. In a later section attention will be called to the fact that the practice of determining promotion by pedagogical age alone should be supplemented by recognition of physiological age, psychological age, chronological age, and social age.

8. The distribution of pupils according to puberty. Some conception of the complexity of problems involved in attempts to adjust education to stages of maturity according to puberty may be gained from an analysis of the pupil population of a school system. In Tables XV–XVIII an estimate is made of such a distribution of pupils in the schools of Paterson New Jersey, in 1913.

From these figures, and from more extended tables on which those given are based, a number of facts may be deduced:

(1) Prepubescent, pubescent, and postpubescent children were found in almost every grade of the school system, the proportion of prepubescents gradually decreasing and the proportion of postpubescents gradually increasing.

(2) Particularly noteworthy is the fact that the ratio of prepubescent boys to postpubescent boys is almost exactly inverted from 56/22 in the seventh grade to 22/58 in the ninth grade, while a similar ratio for girls is approximately inverted from 58/21 in the sixth grade to 18/57 in the eighth grade. Herein are observable: (*a*) the earlier pubescence of girls; (*b*) the transitional character of grades 6/7 to I.

TABLE XV. PERCENTAGES OF PREPUBESCENT, PUBESCENT, AND POSTPUBESCENT PUPILS IN VARIOUS GRADES OF THE PATERSON (N.J.) SCHOOLS IN NOVEMBER, 1913 *

Grades	*Boys*					*Girls*					*Both*				
	Prepubescent	*Pubescent*	*Postpubescent*	*Prepubescent and Pubescent*	*Pubescent and Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*	*Prepubescent and Pubescent*	*Pubescent and Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*	*Prepubescent and pubescent*	*Pubescent and Postpubescent*
1	100	0	0	100	0	100	0	0	100	0	100	0	0	100	0
2	99	1	0	100	1	99	1	0	100	1	99	1	0	100	1
3	97	2	1	99	3	96	3	1	99	4	97	2	1	99	3
4	92	5	3	97	8	89	7	4	96	11	90	6	4	96	10
5	81	11	8	92	19	74	15	11	89	26	78	13	9	91	22
6	69	17	14	86	31	58	21	21	79	42	64	19	17	83	36
7	56	22	22	78	44	36	26	38	62	64	46	24	30	60	54
8	35	22	43	57	65	18	25	57	43	82	26	14	60	40	74
I	22	20	58	44	78	10	19	71	29	90	17	20	63	37	83
II	12	15	73	27	88	3	10	87	13	97	8	12	80	20	92
III	2	8	89	11	97	1	4	96	5	100	2	5	93	7	98
IV	1	3	96	4	99	0	1	99	1	100	0	2	98	2	100

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* Tables compiled by applying to the age-grade distribution of pupils in the Paterson schools for 1913 (*Report of the Board of Education* (1914), pp. 85–86), the proportions of pupils of different ages at different stages of maturity determined for boys by Crampton and for girls by Baldwin. The figures should be regarded as approximate estimates only. The writer has made similar tables for a number of cities which indicate that the situation in Paterson is fairly typical.

TABLE XVI. DISTRIBUTION ACCORDING TO CERTAIN IMPORTANT DIVISIONS — NUMBERS

Grades	*Boys*			*Girls*			*Both*		
	Pre-pubescent	*Pubescent*	*Post-pubescent*	*Pre-pubescent*	*Pubescent*	*Post pubescent*	*Pre-pubescent*	*Pubescent*	*Post-pubescent*
1–8.....	7053	665	688	6267	828	1020	13320	1593	1708
I–IV....	121	125	629	42	96	743	163	121	1372
1–IV....	7174	790	1317	6309	924	1763	13483	1714	3080
1–6.....	6404	363	254	5886	470	366	12290	833	620
7–1.....	738	381	665	415	325	899	1153	706	1564
II–IV...	32	46	398	8	29	498	40	75	896

TABLE XVII. DISTRIBUTION ACCORDING TO CERTAIN IMPORTANT DIVISIONS — PER CENTS

Grades	*Boys*			*Girls*			*Both*		
	Prepubescent	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*
1–8	98.3	84.1	52.3	99.4	89.6	57.8	98.9	86.9	55.4
I–IV....	1.7	15.9	47.7	0.6	10.4	42.2	1.1	13.1	44.6
1–IV....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1–6.....	89.4	45.9	19.1	93.4	50.9	20.7	91.2	48.8	20.1
7–I.....	10.1	48.2	50.7	6.5	45.9	51.0	8.6	46.6	50.8
II–IV...	0.5	5.9	30.2	0.1	3.2	28.3	0.2	4.6	29.1

Explanation: Of prepubescent boys in the schools 98.3 per cent were in grades 1–8 and 1.7 per cent were in grades I–IV, etc.

TABLE XVIII. DISTRIBUTION ACCORDING TO STAGE OF PUBERTY IN VARIOUS DIVISIONS — PER CENTS

Grades	*Boys*			*Girls*			*Both*		
	Prepubescent	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*	*Prepubescent*	*Pubescent*	*Postpubescent*
1–8.....	83.9	7.9	8.2	77.2	10.2	12.6	80.1	9.6	10.3
I–IV....	13.8	14.3	71.9	4.8	10.9	84.3	9.3	12.6	78.1
1–6.....	91.2	5.2	3.6	87.5	7.0	5.5	89.4	6.1	4.5
7–I.....	41.4	21.3	37.3	25.3	19.8	54.9	33.7	20.6	45.7
II–IV...	6.7	9.7	83.6	1.5	5.4	93.1	4.0	7.4	88.6

Explanation: Of all boys in grades 1–8 (elementary school) 83.9 per cent were prepubescent, 7.9 per cent were pubescent, and 8.2 per cent were postpubescent, etc.

(3) Of all the immature (prepubescent) boys and girls in the public schools of Paterson in 1913 all but about one per cent were in the elementary school (grades 1–8).

(4) Of all the maturing (pubescent) boys more than five sixths were in the elementary school: of all the pubescent

girls nearly nine tenths were in the elementary school: of all pubescent pupils (boys and girls together) more than six sevenths were in the elementary school. The largest percentage of pubescent pupils (about 21 per cent) was found in the seventh grade. About six per cent of pubescent boys, about three per cent of pubescent girls, and about five per cent of pubescent pupils were found in grades II, III, IV of the high school. Other pubescent pupils were about equally divided between the division comprising grades 1–6 and the division comprising grades 7–I. More pubescent boys were in the sixth grade than in the entire high school, more pubescent girls in the fifth grade than in the entire high school, and more pubescent pupils in the fifth grade than in the entire high school.

(5) Of all the mature boys (postpubescents) in the schools more than one half were in the elementary school (grades 1–8). Of all the mature girls more than one half were in the elementary school. Of all mature pupils more than one half were in the elementary school and less than one half in the high school. More than one half of the postpubescent pupils of either sex were in grades 7, 6, I. Less than one third of all postpubescent pupils were in grades II, III, IV, of the high school. The largest number of postpubescent pupils was in the eighth grade. Two thirds as many postpubescent pupils were in grades 1–6 as in grades II–IV. There were more postpubescent girls in the sixth grade than in any grade of the high school except grade I.

(6) Of all boys in grades 1–8 of the elementary school 84 per cent were prepubescent, 8 per cent were pubescent, and 8 per cent postpubescent; of all the girls 77 per cent were prepubescent, 10 per cent pubescent, and 13 per cent postpubescent; of all pupils in the elementary school (grades 1–8) 80 per cent were prepubescent, 10 per cent pubescent, and 10 per cent postpubescent.

(7) Of all boys in the high school (grades I–IV) 14 per cent were prepubescent, 14 per cent pubescent, and 72 per cent postpubescent; of all the girls 5 per cent were prepubescent, 11 per cent pubescent, and 84 per cent postpubescent; of all pupils in the high school 9 per cent were prepubescent, 13 per cent pubescent, and 78 per cent postpubescent.

(8) Of all boys in grades 1–6 of the elementary school 91 per cent were prepubescent, 5 per cent pubescent, and 4 per cent postpubescent; of all the girls in those grades 88 per cent were prepubescent, 7 per cent pubescent, and 5 per cent postpubescent; of all pupils in those grades 89 per cent were prepubescent, 6 per cent pubescent, and 5 per cent postpubescent.

(9) Of all boys in grades 7, 8, I (last two grades of the elementary school and first grade of the high school) 41 per cent were prepubescent, 21 per cent pubescent, and 37 per cent postpubescent; of all the girls in those grades 25 per cent were prepubescent, 20 per cent pubescent, and 55 per cent postpubescent; of all pupils in those grades 34 per cent were prepubescent, 20 per cent pubescent, and 46 per cent postpubescent.

(10) Of all boys in grades II–IV (high school II, III, IV) 7 per cent were prepubescent, 10 per cent pubescent, and 84 per cent postpubescent; of all girls in those grades 2 per cent were prepubescent, 5 per cent pubescent, and 93 per cent postpubescent; of all pupils in those grades 4 per cent were prepubescent, 7 per cent pubescent, and 89 per cent postpubescent.

While these figures can apply with exactness to one city only, it is quite probable that they would hold true approximately for the majority of school systems. A number of city school systems examined in the same way indicate similar conditions. Certainly it is true that no simple means can be found to relate the organization of the school system to the complexities found in the phenomena of puberty.

PROBLEMS FOR FURTHER CONSIDERATION

1. How do differences between boys and girls in the rates of physical development affect the problem of coeducation?
2. What administrative problems would be affected by the classification of pupils according to physiological age? How would they be affected?
3. What organs and parts of the body show increased rates of development at adolescence? Which do not? Can any one age be set to cover all cases? (Cf. Hall, G. S., *Adolescence*, vol. I.)
4. Show how growth in height or weight may affect mental traits by causing changes in environmental (social) conditions.
5. Compare any two boys or any two girls of approximately the same age (e.g., between 14.0 and 15.0) and note all the differences in physical traits you can. Do any of the observed differences cause differences in the treatment of them by other people?
6. Reduce the age-grade distribution table of any secondary school to terms of per cents and note the variability.
7. Arrange about one hundred boys or girls of any secondary school grade in the order of their scholastic records (marks): arrange them in the order of their ages: arrange them in the order of their heights or weights. How do the three arrangements compare?
8. Apply the tables of Crampton (Table XI) and of Baldwin (Table XIII) to the age-grade distribution of any school system. Compare with the tables given for Paterson. (Cf. Tables XV–XVIII.)
9. Compare boys of the same chronological age (reckoned within a six-months range) but in different school grades, as to their physical development (height, weight, etc.). Do the same for girls.
10. Compare the boys who leave school during the first year of the secondary school with those who remain, as to height, weight, etc.

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CHAPTER II

THE SECONDARY-SCHOOL PUPIL: MENTAL TRAITS

9. Secondary education and the development of mental traits. While education is fundamentally and primarily conditioned by physical traits of the pupils, secondary education is more directly and immediately concerned for the most part with mental traits. Predominantly it is a process of producing, directing, or preventing changes in the neurone connections which control and determine mental traits. It follows, therefore, that the greater is our knowledge of mental traits and the nature of their development, the more intelligently and efficiently can the process of education be conducted. As was suggested in the previous chapter our knowledge of physical traits and the nature of their development is very inadequate. Even less adequate and reliable is our knowledge of mental traits. Indeed, it may be said that no single psychological trait has ever been adequately measured and that the most painstaking investigations have failed to afford evidence which is entirely satisfactory. Nevertheless such evidence as we have suggests certain general tendencies which it is our duty to recognize until further investigation either confirms or invalidates. An analysis of all the mental traits involved in secondary education lies far beyond the scope of this book and in fact far beyond the bounds of available knowledge. All that can be attempted here is a brief consideration of a few fundamental traits and of certain problems of great importance for secondary education. The chapter will deal: (I) with the development of mental traits with age; (II) with the order of the development of mental traits; (III) with the relation of adolescence to the development of mental traits.

As in the consideration of the development of physical traits in the preceding chapter the reader should be warned against certain misconceptions and misinterpretations. He should be warned that the statistical data presented must be considered as indicative of general tendencies rather than as exact and conclusive evidence as to details. He should remember that mental traits are highly susceptible to the influence of training and hence that in every case such measurements as those presented indicate the status of a mental trait due both to inner growth determined by nature and to training through exercise, so that it is impossible to separate the two factors of nature and nurture and the status indicated represents an actual but not a necessary condition. Finally it must be remembered that where statistical data are presented one must always keep in mind the dangers of drawing conclusions from a relatively small number of cases or of interpreting as normal a status determined from the measurement of a select group.

I. The Development of Mental Traits with Age

10. The development of mental traits with age. It is an extremely difficult task to determine the status of any mental trait at any given age in such a way as to measure the effect of maturity or inborn tendencies alone, and eliminate the measurement of the influence of training or the environment. Commonly the status of any mental trait at any time represents the combined effect of inborn tendencies and of training so that it is practically impossible to isolate the effect of either influence. For that reason it is best to consider first the character of the development of mental traits which are, perhaps, likely to be affected least by special training. For this purpose we may consider the results of Gilbert's measurement of children of different ages with respect to their capacity to discriminate differences in weight and their capacity to react to a given sensory stimulus.

TABLE XIX. NUMBER OF GRAMS DIFFERENCE REQUIRED IN ORDER THAT THE MEDIAN CHILD SHOULD BE ABLE TO PERCEIVE THE DIFFERENCES BETWEEN WEIGHTS. DECREASE IN THE AMOUNTS OF DIFFERENCE NECESSARY DENOTES INCREASE IN ABILITY.*

	Age in years											
	6	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
Grams: Boys	13.0	13.2	12.2	10.2	8.6	10.2	7.6	6.0	5.2	6.2	6.0	6.0
Girls	16.8	13.2	11.0	10.0	9.2	7.6	7.6	5.6	7.2	7.2	6.8	6.4
Both	14.8	13.6	11.4	10.0	8.8	8.6	7.2	5.4	5.6	6.8	6.6	5.8

TABLE XX. NUMBER OF THOUSANDTHS OF A SECOND BETWEEN THE MOVEMENT OF A DISK AND THE MAKING OF A CONTACT BY A CHILD WHO WAS INSTRUCTED TO PRESS DOWN A KEY AS SOON AS HE SAW THE DISK MOVE: MEDIAN TIME. DECREASE IN THE RECORD INDICATES INCREASE IN ABILITY.*

	Age in years											
	6	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*
Time: Boys	282	267	245	243	210	185	178	178	180	167	147	147
Girls	295	315	260	255	225	206	198	205	187	189	172	163
Both	295	292	262	250	215	195	187	187	180	172	155	155

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* Gilbert, J. A., *Researches on the Mental and Physical Development of School Children*, Studies from the Yale Psychological Laboratory, vol. II, pp. 40–100; reproduced by Thorndike, E. L., *Educational Psychology*, vol. III, pp. 273–74. Those not familiar with the term *median* may without serious error interpret it as a measure of the central tendency somewhat similar to the *average*.

The general tendency of the abilities measured to increase with age is obvious. Apparently ability in speed of reaction increases constantly from the age of six to the age of seventeen, and possibly later. Ability to discriminate differences in weight increases continuously until the age of thirteen or fourteen, where the apparent limit of improvement without special practice is approached. Again the reader should be warned that the character of the data does not warrant more than the most general conclusions and limits interpretation except with regard to general tendencies — possibly even there. The particular facts to be noted from such tables are that, in so far as the data are reliable, they indicate that the traits measured tend to increase with age as the result of inner growth and a certain amount of training, and that differences in the rate of development and in the duration of the process of development vary with different mental traits until the limits of capacity are approached.

More complex and more susceptible to the influences of practice and training are the mental traits involved in association and substitution. The results of certain investigations designed to measure abilities in those traits are presented in the following table:

TABLE XXI. THE DEVELOPMENT OF CAPACITY IN ASSOCIATION AND SUBSTITUTION (PYLE)*

	Age in years										
	8	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
a. Part-whole association:											
Average record { Boys	5.5	6.5	7.3	8.9	8.9	11.1	12.2	14.8	15.9	15.8	19.3
Average record { Girls	4.6	5.9	7.8	10.0	10.0	10.8	12.5	14.0	16.9	16.2	19.7
b. Genus-species association:											
Average record { Boys	4.6	5.7	6.5	7.2	7.1	10.0	10.5	11.1	15.2	14.0	17.3
Average record { Girls	5.5	5.4	7.8	8.2	9.3	9.5	11.8	14.0	16.4	16.0	18.3
c. Opposites association:											
Average record { Boys	9.0	8.4	7.5	10.9	11.5	14.5	14.5	16.0	18.6	17.6	22.4
Average record { Girls	8.0	7.6	10.9	11.2	13.9	14.9	17.4	17.3	19.3	21.4	23.4
d. Digit-symbol substitution:											
Average record { Boys	10.3	12.6	15.4	16.3	19.1	22.6	21.1	24.7	24.8	23.8	28.7
Average record { Girls	13.0	15.7	18.8	18.5	22.7	23.4	26.8	26.8	27.5	28.5	25.9
e. Symbol-digit substitution:											
Average record { Boys	10.0	13.2	16.5	17.7	19.3	20.7	23.3	25.8	27.8	26.1	28.0
Average record { Girls	10.9	16.0	19.9	19.6	23.1	25.6	27.4	29.7	29.1	32.0	33.1

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* The figures in this table represent the results of Pyle's investigations. For convenience the figures were taken from Whipple, G. M., *Manual of Mental and Physical Tests*, part II, pp. 75, 78, 82, 139, 140.

In this table it is to be noted that here again we find development of the various mental traits with age and differences in the rates of development as well as in the dates when the limits of improvement begin to be approached. It is, of course, obvious that practice and training exert great influence on such traits as are involved in the processes of association.

Measurement of the development of various memories with age indicate much the same general tendencies as those suggested by the measurements of various forms of association and substitution. This appears from figures which represent the results of a number of investigations.

TABLE XXII. THE DEVELOPMENT OF VARIOUS MEMORIES WITH AGE*

	Age in years										
	8	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*
a. Memory span for Digits:†	6.6	6.7	6.8	7.2	7.4	7.3	7.3	7.7	8.0	8.0	8.0
b. Memory concrete words:‡											
Average record: Boys	31.2	32.4	35.8	37.7	37.7	38.3	40.0	40.2	43.4	45.7	49.0
Average record: Girls	32.9	32.7	39.6	37.7	38.7	40.4	41.2	42.0	42.5	40.5	52.0
c. Memory abstract words:**											
Average record: Boys	22.9	26.3	26.8	31.7	31.0	32.4	37.3	34.1	40.0	41.1	40.8
Average record: Girls	20.5	24.0	31.0	31.8	34.0	36.0	39.0	37.8	41.0	37.0	49.0
d. Memory related words:††											
Average record: Boys	13.0	14.0	15.0	15.0	16.4	16.5	16.9	16.0	17.0	...	...
Average record: Girls	13.0	14.0	15.3	16.5	16.0	17.0	17.5	17.5	17.8	...	...
e. Memory unrelated words:‡‡											
Average record: Boys	11.1	12.2	12.2	12.5	12.8	13.5	13.7	13.7	14.0	...	...
Average record: Girls	11.5	12.4	14.4	14.3	14.0	13.5	14.0	14.0	14.5	...	...
f. Memory ideas:§											
Average record: Boys	24.3	28.7	30.0	32.9	35.1	36.8	36.1	36.5	34.4	34.6	36.9
Average record: Girls	28.5	31.0	33.5	36.4	38.1	38.5	39.0	39.1	37.3	36.6	37.8

* The figures in this table were taken from Whipple, G. M., *Manual of Mental and Physical Tests*, part II, who reproduced them from works and reports of the investigators cited. For the original data see the references given by Whipple, *op. cit.*

† Whipple, *op. cit.*, p. 172.

‡ *Ibid.*, p. 173.

** *Ibid.*, p. 174.

†† *Ibid.*, p. 188.

‡‡ *Ibid.*, p. 188.

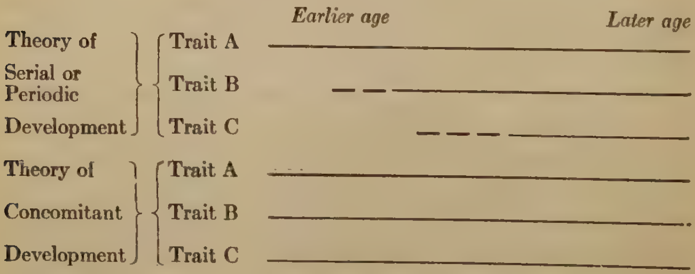
§ *Ibid.*, p. 211.

These figures indicate a general growth of memories with age in most instances continuing through the period of school life. Summarizing the matter considered in this section we are probably safe in holding (1) that in general mental traits improve in efficiency throughout the period of elementary and secondary education; (2) that the rate of improvement with age varies for the different mental traits; (3) that the limits of improvement vary; (4) that there is no evidence that any given status once attained is diminished, except in so far as being in part due to practice and training, deterioration may take place because of the discontinuance of practice or a change in training.

II. The Order of the Development of Mental Traits

11. Theories of the development of mental traits. Serious consequences for secondary education depend on the theory which is followed concerning the order of the development of various mental traits. Two conflicting theories are found. One theory postulates that certain mental processes, e.g., memory, begin their development earlier, develop more rapidly, and approach their maximal development earlier than other mental traits, e.g., reasoning; sometimes further assuming that once the maximum stage of development is reached a period of deterioration sets in. As a consequence it is sometimes maintained that emphasis should be placed on special mental processes at particular ages or stages of development, e.g., that sense perception and sensory discrimination should be emphasized in the education of young children, that education before the age of twelve should emphasize memory and drill, and that reasoning should be reserved for emphasis at adolescence in the secondary school. For convenience we may term this a *Theory of Serial or Periodic Development.* The second theory assumes that, except as affected by exercise and training (factors which may be controlled extensively), the fundamental mental processes develop gradually, continuously, and in a relative degree concomitantly, if not from birth, certainly from the beginning of education in the school, until their maxima are approached; and, further, that deterioration does not necessarily set in until an age much later than the limit of school life. Consequently on the basis of this theory it is maintained that there are no periods in school education when training in certain mental processes should be emphasized to the minimizing or neglect of others. For convenience this may be called a *Theory of Concomitant Development.*

A diagrammatic presentation may illustrate more clearly the difference between the two theories:


Earlier age
Later age
Theory of Serial or Periodic Development
Trait A
Trait B
Trait C
Theory of Concomitant Development
Trait A
Trait B
Trait C

For examples, sensory discrimination may be represented by Trait A, certain forms of memory by Trait B, and certain forms of reasoning by Trait C.

12. **The theory of serial development.** From the beginning of formal education the theory has always been prominent that certain ages were especially appropriate for the training and utilization of different mental processes, on the basis of the supposed superiority of those mental traits at different periods. Likewise it has been supposed that training in and use of certain mental processes should be deferred until the periods when their delayed operation

should begin. Typical of such a theory from one point of view was that of Rosenkrantz who

> divides the life of the child into an intuitive, an imaginative, and a logical epoch. During the first of these periods the appeal should be to the senses. Later imagination and memory are called into play, and the entire movement should culminate in stirring up the logical processes.[1]

A demarcation somewhat similar, though by no means so rigid, is made by Bagley:

> The factor that operates most effectively in the *transition* period (ages six to eight) is vivid portrayal dealing almost exclusively with concrete experiences. Repetition is frequently in order, provided that it involves a minimum of strain and fatigue. Logical reasoning is entirely out of place, and symbols must not be used apart from a direct connection with the concrete experiences for which they stand. . . . In the *formative* period (ages eight to twelve), repetition is the watchword, but it should be strongly supplemented by vivid portrayal and, in the later stages, by the simpler operations of logical reasoning. Symbols should still be closely associated with the concrete, but there is some place for the operation of verbal memory through repetition, even if the underlying conceptions have not been thoroughly traced out. . . . Organization of logical reasoning holds undisputed sway in the *adolescent* stage (ages twelve to eighteen). . . . Moral culture is now entirely of the rational type.[2]

The basis of this theory would appear to be found in the relation which exists between the different mental processes and the order of their operation with reference to any given material. If we consider the mental processes in the order of the simplest and most fundamental to the most complex, e.g., sensation, perception, imagery, association and dissociation, memory, reasoning, combinations of processes, it is recognized that the efficient operation of the latter must be conditioned by the operation of the former processes on which they depend. Association cannot take place without perception and imagery; memory depends on association; reasoning depends on association and dissociation; ordinary learning processes depend on a combination of all mental processes. In a sense, therefore, the operation of the more complex mental processes must follow the operation of the more simple processes. This is true, however, with respect to the application of those processes to specific material and specific situations only; it cannot be considered to mean that complex mental processes applied to materials of every sort and to every situation must wait on the perfection of the operation of the simpler processes as applied to all materials and to all situations, or to mean that the simpler processes can be perfected "in general." Such an assumption as that commonly made involves a theory of general faculties which is quite contrary to modern psychology. The point is well taken by Henderson in commenting on the theory of Rosenkrantz:

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[1] Henderson, E. N., *Textbook in the Principles of Education*, p. 171. Quoted with the permission of the publishers, The Macmillan Company.

[2] Bagley, W. C., *The Educative Process*, pp. 201 - 202 *et antea*. Quoted with the permission of the publishers, The Macmillan Company.

> It involves the assumption that the faculties are distinct, and that they develop independently. The child, it is assumed, first observes without remembering or imagining to any great extent. He thus develops a power of observation that may be used in any field without reference to subject-matter. Later other powers appear, and as soon as one emerges a new form of instruction becomes possible. It is absurd to reason with a child who has not yet attained to the logical period, or to expect him to remember and imagine while he is still in the intuitive stage. Moreover, when once children have reached the rational age, it is supposed that they will be logical on any subject. All these assumptions are faulty. As a matter of fact, a child is usually in the intuitive epoch in respect to some subjects and in the logical as regards others. The analysis of the mental processes does not, as we now realize, mean the discovery of independent faculties, but rather the revelation

of the forms through which any given content must pass as the mind reflects upon it and utilizes it in new conditions. As a guide to the method by which new material must be presented, the idea of a psychological order of development is of great value. But as a clue to the way in which a subject must be taught to a child of a certain age, no matter what his previous experience with that material may have been, it is, to say the least, to be used with caution. Common sense, indeed, tells us that we cannot expect from young children certain complicated pieces of reasoning, based on comprehensive experience and a large number of well-mastered concepts. Nevertheless, it is astonishing what seemingly impossible feats such children will perform, provided the ground is properly prepared. Mathematical analysis impossible to untrained though intelligent adults can be carried on by children in the primary grades.[1]

13. The theory of concomitant development. Opposed to the theory of serial or periodic development is the theory of concomitant development of mental processes. This theory postulates that with respect to the fundamental psychological processes [2] the mode of their operation is the same from birth to death, that their relative efficiency at any given period is determined by the amount of their exercise and the character of the materials on which they are exercised, and that development of mental traits is to be measured not with reference to general faculties but with reference to specific material. The theory may be illustrated in the views of representative psychologists and educators. Dewey's view may be seen from the following quotations:

> The method that emphasizes the psychological and natural, but yet fails to see what an important part of the natural tendencies is constituted at every period by growth of curiosity, inference, and the desire to test, cannot secure a *natural development*. In natural growth each successive stage of activity prepares unconsciously,

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[1] Henderson, E. N., *Textbook in the Principles of Education*, pp. 171–72. Quoted with the permission of the publishers, The Macmillan Company.

[2] For the time being excluding instincts, interests, etc.

but thoroughly, the conditions for the manifestation of the next stage — as in the cycle of a plant's growth. There is no ground for assuming that "thinking" is a special, isolated natural tendency that will bloom inevitably in due season simply because various sense and motor activities have been freely manifested before: or because observation, memory, imagination, and manual skill have been previously exercised without thought. Only when thinking is constantly employed in using the senses and muscles for the guidance and application of observations and movements, is the way prepared for subsequent higher types of thinking.

At present the notion is current that childhood is almost entirely unreflective — a period of mere sensory, motor, and memory development, while adolescence suddenly brings the manifestations of thought and reason.

Adolescence is not, however, a synonym for magic. Doubtless youth should bring with it an enlargement of the horizon of childhood, a susceptibility to larger concerns and issues, a more generous and a more general standpoint toward nature and social life. This development affords an opportunity for thinking of a more comprehensive and abstract type than has previously obtained. But thinking itself remains just what it has been all the time: a matter of following up and testing conclusions suggested by the facts and events of life. Thinking begins as soon as the baby who has lost the ball that he is playing with begins to foresee the possibility of something not yet existing — its recovery; and begins to forecast steps toward the realization of this possibility, and, by experimentation, to guide his acts by his ideas and thereby also to test the ideas. Only by making the most of the thought factor, already active in the experience of childhood, is there any promise or warrant for the emergence of superior reflective power at adolescence, or at any later period.[1]

I have come to believe that reasoning itself, the capacity or ability to reason (or that bundle of minor abilities of which reasoning consists), is not capable of being improved with growing years, or, at least, its improvement is not sufficiently marked to be worth mentioning. Professor James in his *Psychology* speaks in this way about organic memory — "the power to retain." Later investigations have led to some modifications of his statement, but it is generally admitted that the power to improve radical or fundamental memory is slight.[1]

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[1] Dewey, J., *How We Think*, pp. 65–66. Quoted with the permission of the publishers, D. C. Heath & Co.

There are different objects to think about, and different purposes for which to think, because children and grown-ups have different kinds of acts to perform — different lines of occupation, in short. The adult has obviously more complicated activities to carry on; he has concerns that continue over longer stretches of time so that more details enter in, and results are postponed. Hence he must constantly look ahead. The *process* of thinking is essentially the same for little children; but there is such a difference in the materials with which the thinking is done, and the ends for the sake of which it is carried on, that the impression is easily created that the thinking itself is of a radically different order.[2]

Much the same general viewpoint is that of Thorndike:

Now about these mental states (feelings of relationship, meaning, judgments, the three sorts of mental stuff that play the great rôles in rational thinking) in children we may say that by the school age, and in fact long before then, they are all present. The six-year-old has all the elementary feelings involved in reasoning. The change which occurs is not the appearance of these feelings, but their increase in number and definiteness and a change in the manner of their use. The constant increase in general experience of things, and more particularly in increase in definite study of things due to educational influences, forces children to know more relationships between things just as it does to know more things. More and more minute and more comprehensive relationships are grasped. We have thus all stages, from the baby who feels that his father is not like his mother, that two pieces of candy are more than one, to the scientist who notes the similarity between man and the older monkeys or relates the phenomena of gravitation to electrical charges of ions.[3]

. . . From these facts it is clear that, as regards the mechanics of the reasoning process, children differ from adults only as adults differ among themselves. Not some mysterious inner transforma-

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[1] Dewey, J., "Reasoning in Early Childhood," *Teachers College Record*, vol. xv, no. 1, p. 9.

[2] *Ibid.*, p. 10.

[3] Thorndike, E. L., *Notes on Child Study* (2d edition), pp. 92–93.

> tion, but the enlargement and refinement of experience, the formation of systems and suitable ideas, the knowledge of aspects or elements of things essential to different purposes, the acquisition and habitual use of systematic methods of forming and testing conclusions, the growth of skepticism concerning the similarity of things alike in some respects, the definition of terms and the crystallization of experiences into judgments, are what make the rational man out of the blundering child.[1]

From these typical views it is clear that the theory involved concerning the fundamental mental processes is one which assumes that the development of efficiency is more dependent on growth as affected by experience and training than on a serial development of capacities determined by the forces of inner growth, and that all the mental processes are so interrelated and interdependent that serial or periodic development is out of the question.

14. An evaluation of the theories of development. The burden of evidence would appear to be in favor of the theory of interdependent or concomitant development, especially with reference to ordinary mental processes fundamental to learning. Evidence from theoretic psychology, from experimental measurement, and from empirical knowledge gained through ordinary experience inside and outside the school, all point toward the same conclusion — that the fundamental mental processes begin with the early years and continue throughout life without change as far as the mode of their operation is concerned. Development is predominantly a matter of the accumulation of experiences which affect all the fundamental processes. The laws of mental life point unmistakably to an interdependence of the mental processes which precludes any conception of a development of any fundamental process without a possible, commonly a necessary, corresponding modification of those by which its development is conditioned and those whose development is conditioned by it. The stimulus of life's activities, including those of formal education, alone determine whether or not any given mental process shall be exercised and that stimulus affects all mental processes at all ages.

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[1] Thorndike, E. L., *Notes on Child Study* (2d edition), p. 97.

If we turn from the general laws of psychology to the results of experimental investigation of the mental processes employed by children of different ages the evidence points in the same direction. Such measurements as those considered in Tables XIX to XXII indicate that the processes or traits considered were to be found in some degree in children of all ages within the period of school life. This is clearly shown also by the Courtis Tests and by Bonser's studies.[1] It is also true of more general mental operations:

> The ideas of the child are largely new, while those of the adult are oftener old or connected with old ideas; hence the adult's mental grasp is greater chiefly because of knowledge and experience. The effect of knowledge on mental grasp is well shown by a series of experiments in which first-grade children and adults reproduce ordinary letters, Greek letters, and familiar sentences. The adults have little advantage in the case of Greek letters, a great deal in ordinary letters, and are almost infinitely better in reproducing the letters making a sentence. Evidently the difference is due to greater familiarity and increased mental grasp.[2]

If the evidence from the general laws of mental life and the evidence from experimental investigation were wanting, ordinary empirical evidence should be sufficient to guard us against the assumption that young children remember better than older children or that the processes of reasoning do not afford educational opportunity to any considerable extent until the dawn of adolescence. All forms of the mental processes are found in the activities of children throughout the school period. Nor is it true that during the early periods concrete experience alone forms the stuff of mental life and that symbolic and abstract materials are either the sole materials appropriate to later school life or confined to the later periods. Symbolic imagery of the most common type, i.e., letters, words, arithmetical symbols, etc., are employed almost at the very beginning of the child's school life and play a most prominent part throughout. Abstract thinking of a high order may be found in operation in any grade of the school. The extent to which one may rely in teaching on the more complex mental processes is determined by the amount of previous experience rather than by the chronological age reached by the pupils.

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[1] Bonser, F. G., *The Reasoning Abilities of Children of the Fourth, Fifth and Sixth School Grades.*

[2] Kirkpatrick, E. A., *Fundamentals of Child Study*, p. 255. Quoted with the permission of the publishers, The Macmillan Company.

There is a dangerous tendency manifest in some quarters to assume that a close analogy is warranted between the fundamental mental processes and instincts and to base a theory of deferred development and transitory quality for the common mental processes on the assumption of such characteristics for instincts. While the majority of instincts, e.g., fear, curiosity, imitation, etc., are manifest in children from birth, certain other instincts, e.g., the sex instincts, are conceived to be delayed until about the stage of puberty. Likewise it is commonly held that certain instincts, e.g., the "collecting instinct," tend to be transitory, manifesting a period of waxing, a period of ascendency, and a period of waning. Whether or not such characteristics are of frequent occurrence with reference to instincts, there is little ground for assuming like phenomena to be characteristic of the fundamental mental processes of sense-perception, memory, reasoning, and the like.

> If this is the case with James's temperate account, what shall we say of those who describe the inner growth of man's instincts and capacities altogether as a series of tendencies, appearing, wait-

ing, lasting a brief space and vanishing unless then and there fixed as habits — like the ripening of fruits which soon decay unless preserved by the housewivery of habits, or like a procession of candidates which pass through an office, disappearing for good and all unless enlisted at the time and drilled by some recruiting officer of the mind. Such a sharp definition of the rise and fall of original tendencies in a serial order of stages or epochs seems to me to be a gross exaggeration, corresponding only here and there to the actual progress of inner development.[1]

It is doubtful, indeed, that delay in appearance or transitoriness is a law of any extensive application with reference to instincts (though perhaps quite the reverse is true with respect to specific manifestations in the form of special interests which are highly susceptible to the influence of the environment and special training). With respect to the fundamental mental processes evidence is wanting that it can apply at all.

15. **Implications for secondary education.** Almost every phase of the work of the secondary school is affected to a greater or less extent by the theory accepted concerning the order and rate of mental development. Certain implications may be briefly considered here.

(*1*) *Affecting organization and administration:* The articulation between elementary education and secondary education has frequently been based in part on the theory that the mental development of children is serial and periodic and that important differences between children of earlier and later ages justify a rather sharp distinction between elementary and secondary education. This theory is always more or less associated with certain theories of adolescence in relation to secondary education which will be considered at greater length in following sections. In anticipation, how-

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[1] Thorndike, E. L., *The Original Nature of Man*, pp. 266–67. Quoted with the permission of the publishers, Teachers College Bureau of Publications.

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ever, two quotations may be given to illustrate the general attitude. Thus Bagley:

> From these facts (those of mental changes at adolescence), it follows that the methods of moral culture must be transformed *almost in a day*. Just as in mental training "the drill and mechanism of the previous period must be relaxed," so, in moral training, the arbitrary and authoritative rulings that have hitherto been the mainstay must now give place to reason.[1]

In a similar vein writes Davis:

> *American educational work wrongly organized.* — Again the present mode of organizing and administering educational work in America is psychologically ill-grounded. The adolescent period usually begins at about the age of twelve years. With the dawn of this new period come most notable changes in physical form, structure, and function and most decided concomitant psychological changes. At this period self-consciousness is born. The interests that formerly held dominant sway are cast aside. New motives stir, new aspirations fire, new goals beckon. *Conscious logical reason begins to proclaim itself. The mind is no longer satisfied with mere empirical facts, but it demands that the facts be presented in their essential relations.* . . . To enforce unnatural restraints upon an adolescent is to deaden his sensibilities, stifle his intellectual and his social enthusiasm, and atrophy his powers. To keep him under the restrictive and arbitrary discipline of the ordinary elementary school is to sin against nature and to commit an offence against the laws of social well-being. To employ with him the methods of instruction and training of the elementary school is to provoke him to truancy, encourage him to evade school work, and impel him to forsake school duties altogether. *The beginning of adolescence is most emphatically the beginning of the period of secondary education.* As our schools are organized and administered to-day this fact is ignored.[2]

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[1] Bagley, W. C., *The Educative Process*, p. 200. Italics by the present writer. Quoted with the permission of the publishers, The Macmillan Company.

[2] Davis, C. O., *Principles and Plans for Reorganizing Secondary Education*, pp. 69–70 of Johnston, C. H. (Editor), *High School Education*. Italics by the present writer. Quoted with the permission of the publishers, Charles Scribner's Sons.

Underlying such statements as those cited is a theory that elementary and secondary education can be distinguished on the basis of the "mental stages" of the children as determined by the inner growth of certain mental traits, with particular reference to a sudden burst of the capacity to reason with an assumed sudden onset of adolescence. In contrast with such a theory the theory of concomitant development of mental traits would justify no such sharp division between elementary and secondary education, but, on the contrary, emphasizes the importance of recognizing that there can be no sharp dividing line between the two and demands that the transition from elementary education to secondary education be gradual and continuous.

(2) *Affecting subject-matter:* A theory of the serial and periodic development of mental traits has frequently been made the basis of the assignment of various subjects of study to different parts of the school course, assigning to the earlier years subjects of study which are conceived to depend for their mastery on more or less mechanical processes, especially motor ability and memory, and assigning to the later years those subjects of study which are conceived to demand reasoning ability. Thus it is frequently argued that subjects of study requiring motor skill are best acquired by children in the elementary school or in the early grades of the secondary school. Likewise it is argued that the study of foreign languages should be begun at about the age of twelve because of the demand which it makes on memory. So, also, it is claimed that subjects calling for æsthetic appreciation such as literature, and subjects calling for logical reasoning should be deferred and offered relatively late in the school course. Whatever other reasons may justify the location of subjects in various grades of the school, little justification can be found for such arguments as may depend for their validity on an assumption that special mental pro-

cesses are especially favorable at certain ages. Far more satisfactory is the theory that social economy and the character of specific training already given and acquired should be the criteria determining the values and positions of subjects of study in the school. As a matter of fact a subject of study which made no demand on perception, conception, imagery, memory, reasoning (if such should be conceived as a reality) could not be considered appropriate for education, and failure to employ any of those processes in earlier education would probably be the best guarantee that that process would not be efficient at a later stage.

(3) *Affecting methods of teaching:* Obviously the theory adopted with respect to the development of mental traits vitally concerns the methods to be employed in teaching any subject. According to the theory of serial or periodic development emphasis on the concrete or abstract, on memory or reasoning, is to be determined by the age of the pupil and without reference to the stage of his development with respect to the specific materials concerned. At a certain age teaching methods are to rely primarily on memory and to minimize dependence on reasoning. In the succeeding stage the process is to be reversed and inner growth alone is supposed to make possible extensive reliance on the pupil's ability to reason. The conception has vicious results, not only in that it assumes the possibility of the sudden abandonment of habits of memorizing which have been fostered carefully in the earlier stage, and assumes the ready development of habits and ideals of reasoning, but also because it leads to an overemphasis on memorization in the earlier stages and a failure to give needed practice to reasoning without which it is impossible to find it effective at later stages. Only when proper exercise is given to the reasoning processes in connection with the simpler experiences of the earlier stages is there any warrant for expecting their effective oper-

ation with the more complex experiences of the later period. In this connection it may be noted that when reasoning is neglected in the elementary school and emphasized in the high school the rather rapid development of capacity previously discouraged may give the appearance of a sudden inner growth which is, however, but the natural expansion of a capacity previously neglected.

As opposed to this theory, the theory of continuous and concomitant development demands that each mental trait receive due attention throughout the school course and that methods of teaching be adapted to utilize all the fundamental mental traits from the beginning. Obviously maturity here as elsewhere must be an important factor, but maturity should not be measured on the basis of a series of delayed developments of the different mental traits.

(4) *Affecting discipline and treatment of the pupil:* According to the theory of serial or periodic development the treatment of pupils would be determined largely by the factor of age, postulating rather mechanical, submissive action by the pupils during the earlier stages and deferring appeals to reason until the later stages. According to the theory of continuous and concomitant development appeals to the reason of pupils are as appropriate at one age as at another, provided they are adapted to the specific stages of development and provided they are expressed in terms or actions which the pupils' previous experiences can interpret. In any event the transition from the rule of rules to the rule of reason must be gradual.

III. THEORIES OF THE INFLUENCE OF ADOLESCENCE ON DEVELOPMENT OF MENTAL TRAITS

16. Theories of the influence of adolescence. Closely related to the problem considered above is the problem of the influence of adolescence on the development of mental traits and its bearing on secondary education. In its most general form the problem may be stated as follows: Is the course of the development of mental traits such that there are periods of relatively rapid and relatively slow growth, or, is the process of development essentially continuous and gradual? In more special form as having direct bearing on secondary education the problem may be stated thus: Is the onset of puberty (the initial stage of adolescence) relatively sudden and abrupt, does its abrupt appearance entail sudden marked changes in general physical development, and do abrupt and sudden changes in mental traits coincide with such physical changes, or, are all the mental phenomena which are supposed to accompany adolescence characterized by gradual maturing? Two theories are found in psychological and educational theory. One theory assumes that the development of mental traits at adolescence is relatively rapid and is characterized by sudden and relatively abrupt changes. It is commonly termed the *Theory of Saltatory Development* (Latin *saltare* = to leap, to proceed by leaps). The other theory assumes that development is essentially continuous and gradual, such fluctuations as occur merely representing the usual phenomena of a variable factor. This may be called the *Theory of Gradual Development*. The two theories may be roughly contrasted by diagrams. (Figure A.)

17. **The theory of saltatory development.** The phenomena of puberty and adolescence have always been fraught with interest to students of education and particularly to students of secondary education. This interest always present has been stimulated to a high degree by the results of the child study movement of the past quarter century and especially by the publication of Hall's monumental work on *Adolescence* in 1904. Subsequent to the publication of that book few treatments of adolescence, or of the development of

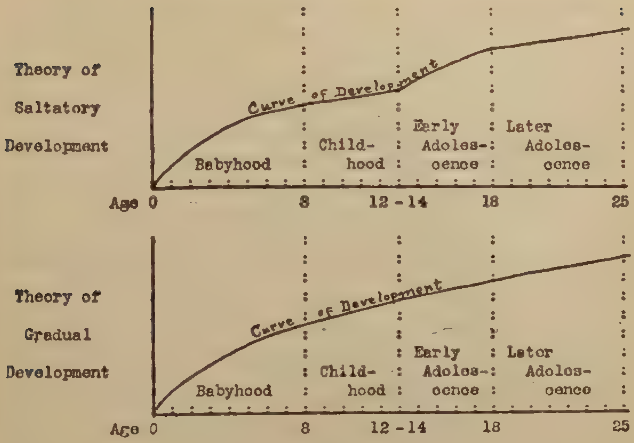

FIGURE A

physical and mental traits with age, have been unaffected by the data which Hall presented and the theories which he set forth. Prominent among those theories was the theory of the saltatory development of mental traits at adolescence, and most treatments of that topic have been more or less colored by the tenets of Hall and his school.

Representative opinions will illustrate the form which the theory of saltatory development takes among its advocates. Burnham states it thus:

> *Physiological changes:* Everybody is familiar with the more obvious changes that occur at this period. The reproductive organs increase in size, the larynx enlarges, the vocal cords become elongated, the volume of the heart is increased. . . . Probably equally important changes occur in the brain; for the shape of the head changes, and new intellectual and emotional activities of this period must be accompanied by the functioning of the cerebral centres that have lain dormant before. This is, moreover, a period of specially rapid growth in both sexes.

> *Psychological changes.* The psychological changes at puberty are no less remarkable. There is a great influx of new sensations. The brain, aroused by these new stimuli, increases its activity. The psychic concomitant of this increased cerebral activity is manifested in a variety of ways. The adolescent mind is filled with hopes, dreams, tempestuous passions, and new ideas. Social and ethical impulses become dominant; egoism often gives place to altruism. Political or religious zeal sometimes become the mainspring of action. *The reasoning powers come into use.*[1]

Hall's theory of the development of physical and mental traits with adolescence is not so readily gained through a single quotation or a few quotations, as from the general tenor of his work. A few characteristic passages, however, will illustrate his theory:

> Adolescence is a new birth, for the higher and more completely human traits are now born. The qualities of body and soul that now emerge are far newer. The child comes from and harks back to a remoter past; the adolescent is neo-atavistic, and in him the later acquisitions of the race slowly become prepotent. Development is less gradual and more saltatory, suggestive of some ancient period of storm and stress when old moorings were broken and a higher level attained. The annual rate of growth in height, weight, and strength is increased and often doubled, and even more. Important functions previously non-existent arise. Growth of parts and organs loses its former proportions, some permanently and some for a season. Some of these are still growing in old age and others are soon arrested and atrophy. The old moduli of dimensions become obsolete and old harmonies are broken. The range of individual differences and average errors in all physical measurements and all psychic tests increases. Some linger long in the childish stage and advance late or slowly, while others push on with a sudden outburst of impulsion to early maturity.[2]

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[1] Burnham, W. H., "The Study of Adolescence," *Pedagogical Seminary*, vol. I (1891), pp. 175–76.

[2] Hall, G. S., *Adolescence*, vol. I, p. xiii. Hall's statement that the range of individual differences in all physical measurements and psychic tests increases is open to contradiction. Cf. Terman, L. M., *The Measurement of Intelligence*, p. 67.

In adolescence, individualism is suddenly augmented and begins to sense its limits and its gradual subordination to the race which the Fates prescribe.[1]

At adolescence each of the senses undergoes certain characteristic changes of structure, function, or both. Interests change and with them the organs of apperception, so that aspects and elements different from those hitherto absorbing the complex but already familiar objects of sense become foci of attention. . . . One of the most important and comprehensive modifications is, that whereas most sense stimuli before this age tend strongly to provoke reflex reactions, after it these tend to be delayed or better organized, as if there were a marked increase of associative or central functions. Before, the projection system predominated, and stimuli, suggestion, and afferent processes generally passed more readily over to the efferent or motor tracts; but now we have increased cerebral irradiations, and there is a marked advance in the development of the long-circuiting functions of thought, deliberation, and reflection.[2]

Of all the changes normal at adolescence, none are more comprehensive and perhaps none are now more typical of the psychic transformation of this age than those that occur in the attitude toward the various aspects of nature. . . . The new life is first born in the heart, and is more or less unconscious, and among its first spontaneous creations are metaphors that may fade and be often recreated, so that language itself becomes fossil poetry. Allegory gives things a dual meaning; symbolism is now first possible, and a widening circle of objects and events acquire a new purport.[3]

At the dawn of adolescence this impulse to migrate or wander shows a great and sudden increase.[4]

But with the teens all this begins to be changed and many of these precepts (for previous education) must be gradually reversed. There is an outburst of growth that needs a large part of the total kinetic energy of the body. . . . The mind at times grows in leaps and bounds in a way that seems to defy the great enemy, fatigue, and yet when the teacher grows a little tiresome the pupil is tired in a moment.[5]

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[1] Hall, G. S., *Adolescence*, vol. II, p. 58. Quotations from *Adolescence* with the permission of the publishers, D. Appleton & Co.

[2] *Ibid.*, vol. II, p. 2.

[3] *Ibid.*, vol. II, pp. 144–45.

[4] *Ibid.*, vol. II, p. 377.

[5] *Ibid.*, vol. II, pp. 453–54.

Whether or not unqualified advocacy of the theory of saltatory development can be ascribed to Hall, certain it is that many educators and psychologists more or less influenced by his work have adopted that theory without appreciable qualification. On no other theory could be justified such extravagant expressions as the following: "At this period self-consciousness is born. The interests that formerly held dominant sway are cast aside. New motives stir, new aspirations fire, new goals beckon. Conscious logical reason begins to proclaim itself."[1] "*Mentally*, then, as well as physically, adolescence is a new birth";[2] etc.

18. **The theory of gradual development.** Opposed to the theory of saltatory development is the theory of gradual development which postulates that growth in the mental traits is essentially gradual. Again the form which this theory may be seen best from typical views. Thus Thorndike:

> I conclude, therefore, that the development of mental traits with age has not been and cannot be adequately measured by such studies as those quoted (Gilbert). To measure it we must repeat measurements upon the same individuals and for all purposes of inference preserve intact each of the individual changes. In connection with each of them account must be taken of the training which the individual in question has undergone.
>
> What measurements we do have may serve, however, to correct two errors of common opinion. The notion that the increases in ability due to a given amount of progress toward maturity are closely alike for all children, save the so-called "abnormally precocious" or "retarded," is false. The same fraction of the total inner development, from zero to adult ability, will produce very unequal results in different children. Inner growth acts differently, according to the original nature that is growing.
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> The notion that maturity is the main factor in the differences found amongst school children, so that grading and methods of

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[1] Davis, C. O., p. 69, of Johnston, C. H. (Editor), *High School Education.*

[2] Bagley, W. C., *The Educative Process*, p. 196.

teaching should be fitted closely to "stage of growth," is also false. It is by no means very hard to find seven-year-olds who can do intellectual work at which one in twenty seventeen-year-olds would fail.[1]

Two general questions concerning the time-relations of original tendencies may be discussed here because of their intrinsic importance and their service in predisposing the student to a critical attitude in connection with the general literature of mental development in childhood. These questions concern the *suddenness of the waxing of delayed tendencies* and the *frequency of transitory tendencies.*

It is a favorite dictum of superficial psychology and pedagogy that instincts lie entirely dormant and then spring into full strength within a few weeks. At a certain stage, we are told, such and such a tendency has its "nascent period" or ripening time. Three is the age for fear, six is the age for climbing, fifteen is the age for coöperativeness, and the like. The same doctrine is applied to the supposed "faculties" or very general capacities of the mind. Within a year or two around eight the child is said to change from a mere bundle of sensory capacities, to a child possessed of imagination; somewhere around thirteen another brief score of months brings his reasoning up from near zero to nearly full energy; a year or two somewhere in the teens creates altruism!

These statements are almost certainly misleading. The one instinct whose appearance seems most like a dramatic rushing upon life's stage — the sex instinct — is found upon careful study to be gradually maturing for years. The capacity for reasoning shows no signs by any tests as yet given of developing twice as much in any one year from five to twenty-five as in any other. In the cases where the differences between children of different ages may be taken roughly to measure the rate of inner growth of capacities, what data we have show nothing to justify the doctrine of sudden ripening in a serial order.[2]

The few interests whose strength, period by period, have been more or less well measured, give no evidence of any sudden acces-

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[1] Thorndike, E. L., *Educational Psychology,* vol. III (1914), pp. 279–80. Quoted with the permission of the publishers, Teachers College Bureau of Publications.

[2] Thorndike, E. L., *The Original Nature of Man,* pp. 260–61. Quoted with the permission of the publishers, Teachers College Bureau of Publications.

> sion of power. Thus collecting seems to increase in vigor gradually from before six to ten. The capacities of sensory discrimination, memory, observation and the like which have been measured in children at different ages, are of course in the conditions that they are at any age because of training as well as inner growth, and the facts concerning their rates of gain cannot be used at their face value in our argument. But so far as they do go, they give no support to the theory of the sudden rise of inner tendencies. Indeed every tendency that has been subjected to anything like rigid scrutiny seems to fit the word gradual rather than the word sudden in the rate of its maturing.[1]

Briefly stated, Thorndike's theory may be considered essentially this: that development must be considered chiefly with reference to the individual and with less importance attached to group averages; that development is a matter of specific traits, not general "faculties"; that the data accessible as regards both physical and mental development are at present very inadequate; that, such as the evidence is, it points toward continuous and gradual development rather than toward sudden transitions. These views essentially constitute the theory of gradual development.

The general theory of continuous and gradual development is expressed by King as follows:

> When any period of life is set off for special study there is danger of drawing a picture that is exaggerated and untrue to reality. This is especially the case with both childhood and youth. In our eagerness to state clearly the traits of the period with which we are concerned, we tend to draw lines of definite separation between what has come before and what comes after. This indeed has been a vice of all those who take up any part of a series of changes for particular study. . . .
>
> In just this same way the so-called periods of life from birth to maturity exist largely in the mind of the over-eager observer. The more we know about human nature, the more we are convinced

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[1] Thorndike, E. L., *The Original Nature of Man*, pp. 262–63. Quoted with the permission of the publishers, Teachers College Bureau of Publications.

that development is a continuous process. The child is, it is true, different from the youth, and the youth from the man, but these differences have come about through infinitely minute gradations rather than by great leaps. Much has been made, for instance, of the difference between the religion of the child and of the youth, and yet everything to be found in the moral and religious point of view of the youth had its beginnings and its incubation in childhood. There is no abrupt shift from one to the other. This does not mean, of course, that no time of life has any striking or distinctive characteristics. We are striving rather to emphasize the fact that what we always find, when we look carefully, is continuity in development rather than abrupt transition.

Even on the physical side of child development this is perfectly true. The time of rapid growth, at the period of puberty, does not normally begin suddenly nor does it end all at once. Even though the actual rise in the curves of height and weight occur with seeming abruptness, the child has, in the years previous, been getting ready for this accelerated development. . . .

The development of the sex instinct at puberty is no exception to this rule. The manifestations of this impulse at that time are usually so striking that psychologists have tended to point to it as an instance of sudden transition. The little child has been assumed to be sexless in all his interests. The meaning of sex suddenly, it has been held, dawns upon him at puberty. This view is quite erroneous. The sex life of the child begins at birth. Gradually, through the years of childhood, differentiation goes on, not merely in the physical organism but also in mental attitudes, interests, in general points of view. One of the most important contributions of the study of early and later childhood has been the discovery that sex impulses and interests appear, normally, very early and develop as an integral part of the childhood self. The period of puberty, therefore, marks no abrupt transition; but is simply the time when the long antecedent development emerges, occupies a larger place in the child's horizon, and attracts the attention of the observer so that he drops into the fallacy of imagining that something entirely new has suddenly come into being.

Youth is a transition period, but no more so than is any season of life, so long as life continues to be truly alive, for life is, in its essence, change and progress for better or for worse.[1]

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[1] King, I., *The High-School Age*, pp. 66–71. Quoted with the permission of the author and his publishers, Bobbs-Merrill Company.

The clarity of King's presentation leaves no opportunity to escape the conclusion that his views involve the theory of continuous and gradual development.

19. Evaluation of the two theories. In attempting to evaluate the two theories of development above presented it is necessary briefly to examine and interpret the data and arguments on which the theories depend. When the theory of saltatory development is thus examined it is found to rest on the assumption of the saltatory development of physical traits, an analogy between physical and mental traits, and certain evidence which is supposed to support the theory directly. Thus it is held that quantitative measurements of certain parts and organs of the body indicate that at puberty a rather sudden and abrupt change is found in the rates of development. Growth in height and weight at adolescence especially is instanced. Facts indicate the possibility of such sudden accession of development in the case of some organs and parts of the body, though the interpretation of certain data is open to question because of their character, the method of investigation or measurement, and the deductions made. In the case of other parts and organs the available data point toward quite a different condition, so that it is clear that not all parts and organs manifest sudden maturing at puberty and, therefore, that any statement of saltatory development *in general* is not justified and probably not true. As has been suggested (e.g., in the quotation from King above), some misconceptions are involved even in interpreting measurements in growth and height, and even in the case of the development of physiological traits characteristic of puberty abrupt development is not to be assumed as established. Unless more tangible connection between the physiological organs directly indicative of puberty and other physical and physiological traits can be shown, we should have little warrant in assuming radical changes in those other traits to be determined by or to be coincident with puberty, even if it could be shown that the latter were abrupt and sudden in development. The burden of proof is positive, not negative.

When the none too well established theory of saltatory development of physical traits is made the basis of an analogy on which to build up a theory of saltatory development of mental traits, a dangerous step is taken. Argument by analogy is always treacherous and always requires corroborative evidence. Certainly in the present case, if it is to be employed at all, the analogy should be drawn to all organs and parts of the body or to the body as a whole, rather than to certain parts only, which themselves differ from other parts in the nature of their development. More appropriate still would be an analogy to the physiological development of the nervous system, especially to the development of the higher centers in the brain. It is, however, just here that we have the least reliable data. Such as the data are they are in many respects unfavorable to a theory of saltatory development. Certainly it is vicious to argue in a circle that observed changes in physical development indicate changes in mental traits, and then to argue that " the new intellectual and emotional activities of this period must be accompanied by the functioning of cerebral centers that have lain dormant before."

Direct evidence of the development of mental traits with age is of two sorts: (1) that obtained by careful quantitative measurement, and (2) that obtained from psychological introspection (analyzing one 's own mental processes) and through the questionnaire method. Advocates of the theory of saltatory development have depended largely on the second of the two sorts of data. The dangers of introspection on the part of untrained persons are readily recognized. When the errors incident to its use are combined with the pitfalls of the questionnaire method such results as are obtained cannot be regarded without suspicion and doubt. Certainly an examination of some of the studies made in this field and by those methods cannot fail to leave the critic wholly skeptical of the greater part of such investigations and unwilling to accept the conclusions reached.[1]

Arguments for the theory of gradual development rest largely on the results of such quantitative measurements as those referred to above. Advocates of the theory hold that such data as we have, inadequate though they are for exact analysis, are indicative of continuous and gradual development in mental traits. This is shown in the tables presented in the first sections of this chapter.

20. Implications for secondary education. The entire economy of secondary education is seriously affected by the problem involved in the theories above outlined. Questions of vital importance in connection with the organization and administration of the school, subjects of study, methods of teaching, and the treatment of secondary school pupils depend for their solution on the adoption of either of the two theories discussed.

(*1*) *Organization and administration:* When one examines the literature of secondary education he finds it replete with references to it as the institution for the education of adolescent boys and girls, which is in general a fact not open to question. Secondary education is indeed largely a matter of the education of adolescents. When, however, it is maintained that the change from preadolescence to adolescence is relatively sudden and abrupt, and hence that a relatively radical differentiation should be made between elementary education and secondary education, or that the organization and administration of the school system should be based on the assumption that homogeneity is characteristic of the children before and after puberty, the grounds for such a theory are by no means so well established. For many years the assumption that relatively sudden and abrupt changes take place in the individual at the age of approximately fourteen years has been made the justification of our present division between elementary and secondary education. Thus Monroe:

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[1] For criticism of this method of investigation see Thorndike, E. L., *The Original Nature of Man*, pp. 27–42.

> It is now known that during the adolescent period the child undergoes such a radical change, physically and psychically, that education can find in these changes the sufficient basis for a differentiation between the earlier and the secondary stages of education. . . . Other reasons were more influential in setting the age limits of the American secondary school, but the general recognition of the peculiar interests, abilities, and characteristics of the adolescent age has had much to do with determining these limits. While the democratic feature of elementary education is no doubt the determining factor in fixing the beginning of the secondary school period at about the fourteenth year, the recognition of the importance of the adolescent period has grown in weight throughout the history of the American high school.[1]

More recent studies of the phenomena of puberty and adolescence have been interpreted to indicate that the adolescent period usually begins at an earlier stage than at the age of fourteen, probably nearer the age of twelve, and as a result the assertion is sometimes made that on that basis secondary education should begin at about that age. Thus Davis:

> Again, the present mode of organizing and administering educational work in America is ill grounded. The adolescent period usually begins at about the age of twelve years. . . . The beginning of adolescence is most emphatically the beginning of the period of secondary education.[2]

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[1] Monroe, P., *The Principles of Secondary Education*, pp. 9–10. Quoted with the permission of the publishers, The Macmillan Company.

[2] Davis, C. O., at page 69 of Johnston, C. H. (Editor), *High School Education.*

In complete form the argument may be stated thus: Adolescence begins at the age of twelve (thirteen ? fourteen?); marked, sudden and abrupt physical and psychical changes take place in children at the onset of adolescence; the separation between elementary education and secondary education should be determined by this factor of adolescence. It is obvious that the validity of the conclusion depends on the validity of the premises. It is also obvious that the theory of continuous and gradual development would lead to a far different conclusion. The argument based on that theory would run somewhat as follows: Development at puberty and adolescence must be conceived essentially as unitary, continuous, and gradual process, adolescence itself being but a period of change extending over a fairly long period of time and being but an integral part of a larger period of growth without points of definite demarcation which sharply differentiate it from earlier or later development. Consequently no definite dates can be set for puberty and adolescence so that any sharp separation of elementary and secondary education is without justification.

The general principles affecting the validity of the premises of the two fundamental theories involved have been discussed above. There remain, however, at least two important factors to be considered, especially as affecting the practicability of adapting the organization and administration of the system of education to the implications of the theory of saltatory development at adolescence. The first factor to be considered involves the element of variability. In the data which were presented regarding physical and mental traits emphasis was centered on "averages," etc. It is always important, however, in dealing with groups of individuals and in measuring traits which vary in amount among those individuals, to take account of the amount of variability as well as the central tendency as measured by the average, median, mode, etc. It is recognized that at all times different amounts of a trait will be found for different individuals. It is recognized that the time of the onset of pubescence differs for boys and girls, that the time varies for either sex, and that the duration of the process of change varies. Since we are dealing with a variable quantity it is important to know not only the central tendency of the age at which adolescence begins (e.g., the average age for the beginning of adolescence), but also the amount of the variation from that central tendency. If, for instance, the central tendency of the age for the ending of prepubescence and the beginning of pubescence in the case of boys is found to be fourteen years, and the variation of individuals from that age were such that the majority of boys began to be pubescent within a few months of that age, a working scheme allowing for the saltatory theory of adolescence would be possible. If, on the other hand, the variation were such that a range of a year or two or even more from the central tendency would be found necessary in order to include even a majority of boys, organization and administration on the basis of the saltatory theory of development would be impracticable unless we adopt *in toto* a scheme of promotion based solely on physiological age as suggested by Crampton and Foster. Fortunately we possess certain figures for variability which may be considered at least as reliable as the figures for averages, etc. Thus, on the basis of his examination of high-school boys of New York City, Crampton found that for the ending of prepubescence and the beginning of pubescence the middle of the mean years was fourteen years, the average age 13.44 years, with a variability of, more or less, 1.55 years, or more than a year and a half. This means that with an average date marking the beginning of pubescence of about thirteen and one half years, it required a range of more than three years to include two thirds of the boys measured. The importance of the factor of variability with reference to puberty may be noted from the tables indicating the stages of puberty in high-school boys and in girls (Tables XI and XIII). On the basis of those figures if we should assume that all boys of the age of thirteen could be grouped into one school grade we should find approximately one half of the boys (41–55 per cent) immature (prepubescent), approximately one quarter (26–28 per cent) maturing (pubescent), and approximately one quarter (18–31 per cent) mature (postpubescent). If we apply the same test to boys fourteen the proportions would be about one fifth (16–26 per cent) immature, about one quarter (24–28 per cent) maturing, and about one half (46–60 per cent) mature. For fifteen-year-old boys the proportions are about twelve per cent immature, about twenty-two per cent maturing, and about sixty-five per cent mature. The writer has applied the estimates of Crampton to the age-grade distribution of the first grade of a number of high schools. In every case on the basis of his figures we should find approximately one quarter of the boys immature, about one fifth in the maturing stage, and a little over one half postpubescent. In the seventh grade about one half of the boys were found, on the basis of such figures, to be in the prepubescent stage, one quarter each in the pubescent and postpubescent stage. In the eighth grade about thirty-five per cent were theoretically in the prepubescent stage, about twenty-three per cent in the pubescent stage, and about forty-one per cent in the postpubescent stage.

The second factor which affects the problem is directly related to that just considered and arises out of the age-grade distribution of pupils in the public schools. It is sometimes argued that important changes calling for adjustment come with adolescence; it is argued that adolescence begins approximately at the age of twelve (thirteen? fourteen?);

it is argued that the secondary school should begin with children at the age of twelve. The obstinate fact is that we do not get a large proportion of the children of the age of twelve or even thirteen in the seventh grade. Proper recognition of physiological age would justify some modification of present conditions. It can never entirely eliminate retardation or acceleration and it never should.

Briefly to summarize, we may say that the theory of saltatory development which forms the basis of the argument for the sharply separated division of elementary and secondary education is itself open to question. If, however, its validity be granted, the great variability of the age at which puberty begins precludes any attempt to organize our schools definitely on the basis of the phenomena of adolescence. Finally, even if we grant the validity of the theory of saltatory development and even if we should assume that the variability in the date and duration of puberty were small enough to permit fairly homogeneous groupings, the age-grade distribution of pupils in the schools would prevent us from definitely organizing the system other than in a general way on the basis of the needs of adolescents.

(2) *Subject-matter:* Theories of saltatory development or of gradual development are not without importance in connection with the character of the subject-matter considered appropriate for the various grades of the school. One of the most noticeable results of adherence to the theory of saltatory development is found in the rather abrupt change from relatively concrete and familiar subject-matter of the elementary school to the relatively abstract and unfamiliar subject-matter of the secondary school. Thus Monroe:[1]

> That the influence of the adolescent factor has been stronger than most others is shown by the fact that foreign languages, science,

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[1] Monroe, P., *Principles of Secondary Education*, p. 10.

and higher mathematics have been made to conform to this distinction, when experience, the conditions in other countries, and the interests of the child would dictate an earlier approach.

Certainly one may readily observe that the character of the secondary-school studies, even in the first year of the course, as a whole differ markedly from the character of the subject-matter of the elementary school, even in the last grade of that school. Only a thorough-going acceptance of a theory of saltatory development could justify the abrupt changes in studies which confront the pupil on passing from the last grade of the elementary school to the first grade of the secondary school. The theory of gradual maturing would permit no such sharp separation of subjects of study, but would postulate that the transition from relatively concrete subjects to relatively abstract subjects should be gradual.

(3) *Methods of teaching:* A number of factors combine to make methods of teaching in the secondary school at present noticeably different from those employed in the elementary school, especially the fact that teachers in the two departments ordinarily receive very different training. Problems of method in teaching in the two schools, however, are affected in no small degree by the theoretical considerations at present under discussion. It is by no means uncommon to find very radical differences in the methods of teaching justified on the basis of the theory of saltatory development at adolescence. On such grounds we find it argued, for instance, that methods of teaching language, especially foreign languages, when begun in the earlier grades, should be taught in those grades by methods which may be abruptly changed for pupils in the first grade of the high school. A number of factors enter to determine any final judgment concerning the place of the study of foreign language and the methods by which it should be taught. It must be recognized also

that different methods of teaching are appropriate for pupils of different stages of development. Abrupt changes in methods of teaching, however, could be justified only on the basis of a theory of saltatory development. The theory of gradual maturing, while recognizing the need for differences in method of teaching pupils of different stages of development, insists that the transition in methods must be gradual. Hence it is argued by advocates of that theory that any abrupt change in teaching methods when the pupil passes into the secondary school involves a fundamental error.

(4) *Discipline and the treatment of pupils:* Under existing circumstances important differences are found between methods of discipline and of treating pupils in the elementary school and in the secondary school so that difficult adjustments face the pupils on passing from the one to the other. In the elementary school, even in the last grades, pupils are under a maternalistic system of supervision and control, discipline is a matter of rules, and little if any freedom is afforded in studies or in conduct. On entering the secondary school supervision and control are radically changed, reason tends to replace petty rules, and a considerable amount of responsibility is thrown on the pupil for his own conduct and to some extent for his own education. The only possible justification for such a condition of affairs could be found in the theory that the pupil becomes a radically different being, suddenly endowed with powers never before manifest, between June and September of the same year. This would be an extreme form of the theory of saltatory development. Advocates of that theory have much to answer for in the present situation. A theory of gradual maturing would dictate that changes in the methods of discipline and of the treatment of children should be gradual. Its acceptance in practice would do much to reform existing conditions in the relation of elementary and secondary education.

PROBLEMS FOR FURTHER CONSIDERATION

1. Explain how the fallacy of selection may affect the problem of measuring the development of a mental trait when averages for different groups at different ages are made the basis for determining development.
2. Take any one set of measurements in Table XXI or Table XXII. Compare the rates of change year by year in terms of the percentile increment.
3. From the data given in Tables XXI and XXII, draw graphs of the curve of development of some of the mental traits.
4. Indicate as many phases as you can of current educational theory and practice in the late elementary- or early high-school grades which show evidence of the influence of a theory of serial or periodic development.
5. Show how those phases of theory and practice would be modified to conform to the theory of continuous and concomitant development.
6. How would the choice of material and methods of teaching plane geometry in the eighth grade differ from those found in the first or second year of the high school on the basis of the theory of serial or periodic development? How would adherence to the theory of continuous and concomitant development affect this problem?
7. Why is the questionnaire method of doubtful value in obtaining data concerning the status or development of such phenomena as the rise of altruism, religious convictions, interests in literature, in the opposite sex, etc.?
8. Consider differences in teaching English in the elementary school and in the secondary school. In how far are such differences due possibly to a theory of saltatory development?
9. Indicate ways in which changes in the treatment which others extend to pupils in the first year of the high school may itself account for certain somewhat sudden changes in pupils' attitudes and reactions.
10. On the basis of a theory of gradual development during adolescence how could the work of the high school be better adapted to provide for gradual changes in methods of teaching, etc.?
11. What bearing do the theories of development considered in this chapter have on plans for the reorganization of education? (Cf. Chapter VII).

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CHAPTER III

THE SECONDARY-SCHOOL PUPIL: INDIVIDUAL DIFFERENCES

21. Importance of recognizing individual differences. Within recent years two factors have tended to emphasize the importance of recognizing individual differences among secondary-school pupils: (1) the increasing heterogeneity of the secondary-school population; (2) the development of the psychology of individual differences.

(1) Until toward the close of the nineteenth century pupils enrolled in the secondary schools of the country constituted a roughly homogeneous group in the sense that they were boys and girls from relatively well-to-do American families, who for the most part looked forward to a cultural education in the high school which would prepare them for college and for the higher walks of life. The past quarter century, however, has marked a period in the development of secondary education characterized by the expansion of the secondary school so as to provide education for classes of pupils never before represented in large numbers in the secondary school. The result has been a very greatly increased heterogeneity in the high-school population, and consequently a demand for increased attention to the varied capacities, interests, and probable future activities of secondary-school pupils, and to the differentiated needs of society.

(2) Within the past decade educational psychology has found no more fruitful field than that of the psychology of individual differences, and in no other field have the results of psychological investigation contributed more to our educational theory and practice. It has, of course, always been

recognized that individuals differ each from the other in physical and mental traits. Only recently, however, have we begun to realize the full meaning of that fact and the implications for secondary education. It is probably no exaggeration to say that the adaptation of secondary education on the one hand to meet the needs of different capacities, interests, and probable futures among pupils, and on the other hand to meet the differentiated needs of society, is the most important problem of secondary education at the present time.

Some idea of the great range of abilities among secondary-school pupils may be gained from an examination of the conditions indicated in Tables XXIII–XXIV.

When we note that high-school pupils who are engaged in the study of algebra may differ so widely in their abilities to perform the ordinary operations of arithmetic that some are from three to four times as capable as others in addition, subtraction, multiplication, and division, and almost immeasurably more efficient in handling abstract examples and reasoning as measured by the Courtis Tests, the importance of recognizing individual differences in capacities is impressed on us.

22. The distribution of individual differences. In considering differences among pupils of any given group with reference to the amounts of a trait possessed, there is always an unconscious tendency to separate the individuals and classify them in more or less discrete groups, e.g., short, medium-sized, and tall boys; young, average-aged, and older pupils — with an assumption (again commonly unconscious) that those groups may be rather sharply differentiated. Such procedure is usually fallacious and is as objectionable and productive of evil results in practice as it is unsound and unjustified in theory. It is a fact of importance that in the case of most if not all traits having bearing on secondary edu-

TABLE XXIII. INDIVIDUAL DIFFERENCES IN SEVENTH AND EIGHTH GRADE PUPILS *

Trait	*Minimum*	*Maximum*	*Range*	*Maximum ÷ Minimum*
Age in months	140.5	220	79.5	1.6
Height in inches	54	67.5	13.5	1.3
Grip in kilograms	20	45.5	25.5	2.3
Cancellations, number of A's	39	95	56	2.4
Addition, number of problems	0	9	9	?
Spelling, per cent right	20	94	74	4.7
Associations, number right	0	21	21	?
Auditory memory, per cent	38.3	90	51.7	2.4
Visual memory, per cent	46.6	96.3	51.7	2.1

* Chambers, W. G., "Individual Differences in Grammar Grade Children," *Journal of Educational Psychology*, vol. I, pp. 61–75.

TABLE XXIV. DIFFERENCES IN ARITHMETICAL ABILITIES IN FIRST-YEAR HIGH-SCHOOL PUPILS (COURTIS TESTS)†

Trait and Test	*Minimum*	*Maximum*	*Range*	*Maximum ÷ Minimum*
1. Addition	35	115	80	3.29
2. Subtraction	25	105	80	4.20
3. Multiplication	25	85	60	3.40
4. Division	25	105	80	4.20
5. Copying figures	5	205	200	41.00
6. Speed reasoning, attempted	1	13	12	13.00
Speed reasoning, right	0	10	10	?
7. Abstract examples, attempted	7	19	12	2.71
Abstract examples, right	0	19	19	?
8. Reasoning, examples attempted	0	8	8	?
Reasoning, examples right	0	7	7	?

† Compiled and arranged from Courtis, S. A., in *Report of the Committee on School Inquiry*, Board of Estimate and Apportionment, City of New York, vol. I, pp. 434, 440–44.

cation, sharply differentiated groupings of pupils must be considered as arbitrary divisions which may facilitate organization and administration, but may also lead to baneful educational results.

If we consider, for example, the age of pupils in any grade of the secondary school we find that the term "average age" means little, and that the classification of pupils as young, average-aged, and old is even less intelligible. Thus in the following table classification on such a basis would mean little.

TABLE XXV. AGE DISTRIBUTION OF 949 PUPILS ENTERING THE PUBLIC HIGH SCHOOLS OF NEW YORK CITY IN 1906*

Age in years	*Boys*		*Girls*		*Both*	
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
11.5–12.0	2	0.6	0	0.0	2	0.2
12.0–12.5	2	0.6	2	0.4	4	0.4
12.5–13.0	13	3.6	13	2.2	26	2.7
13.0–13.5	45	12.4	73	12.4	118	12.4
13.5–14.0	55	15.2	85	14.5	140	14.8
14.0–14.5	55	15.2	116	19.8	171	18.0
14.5–15.0	74	20.4	105	17.9	179	18.9
15.0–15.5	38	10.5	87	14.8	125	13.2
15.5–16.0	35	9.7	53	9.0	88	9.3
16.0–16.5	24	6.6	37	6.3	61	6.4
16.5–17.0.	12	3.3	12	2.0	24	2.5
17.0–17.5	6	1.6	3	0.5	9	1.0
17.5–18.0	1	0.3	1	0.2	2	0.2
Median	14 yrs., 6 mos.		14 yrs., 6 mos.		14 yrs., 6 mos.	
M.D.	9 mos.		8 mos.		8 mos.	

* Compiled and arranged from data given by Van Denburg, J. K., *Causes of the Elimination of Students in Public Secondary Schools of New York City*, p. 23.

The distribution of various amounts of any trait follows regular laws and is not haphazard and hit-or-miss. It has been found that in the case of variable physical and mental traits, where a sufficiently large number of individuals is measured and no selective agency is involved, the numbers of individuals possessing different amounts of the trait measured tend to be distributed according to the laws of probability. Such laws imply that between the lowest amount of the trait which is found in an individual at one extreme, and the highest amount which is found in an individual at the other extreme, individuals will be found possessing different intervening amounts of the trait; that the greatest number of individuals manifesting any given amount of the trait will be found at a point half-way between the two extremes; that the number of individuals possessing various amounts of the trait increases as the mid-point is approached from either extreme according to a fixed mathematical law. Such a distribution is illustrated in the following tables.

TABLE XXVI. DISTRIBUTION OF VARIOUS AMOUNTS OF HEIGHT IN THE CASE OF 1171 AMERICAN SIXTEEN-YEAR-OLD GIRLS, COMPARED WITH AN APPROXIMATE THEORETIC DISTRIBUTION*

Height in centimeters	*Actual distribution 1171 cases*		*Theoretic distribution 1024 cases*	
	Number	*Per cent*	*Per cent*	*Number*
136–139	2	0.2	0.1	1
140–143	12	1.0	1.0	10
144–147	54	4.6	4.4	45
148–151	159	13.6	11.7	120
152–155	280	23.9	20.5	210
156–159	310	26.5	24.6	252
160–163	218	18.6	20.5	210
164–167	102	8.7	11.7	120
168–171	31	2.6	4.4	45
172–175	2	0.2	1.0	10
176–179	1	0.1	0.1	1
139–177	1171	100.0	100.0	1024

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* Figures for the actual distribution compiled from data given by Burk, F. (after Boas). "The Growth of Children in Height and Weight," *American Journal of Psychology*, vol. IX (1897–98), p. 266.

Table XXVII. Distribution of Arithmetical Abilities (Abstract Examples — Courtis Test No. 7) in the Case of 996 High-School Pupils in New York City*

Number of Examples Done Correctly	*Actual Distribution 996 Cases*		*Theoretic Distribution 1024 Cases*	
	Number	*Per cent*	*Per cent*	*Number*
0–1	4	0.4	0.1	1
2–3	15	1.5	1.0	10
4–5	54	5.5	4.4	45
6–7	108	10.9	11.7	120
8–9	206	20.9	20.5	210
10–11	212	21.5	24.6	252
12–13	203	20.6	20.5	210
14–15	123	12.5	11.7	120
16–17	58	4.9	4.4	45
18–19	13	1.3	1.0	10
(20–21)	(0)	(0.0)	0.1	1
0–19	996	100.0	100.0	1024

* Actual distribution compiled from Courtis, S. A., in *Report of Committee on School Inquiry*, Board of Estimate and Apportionment, City of New York, vol. I, p. 434.

Such tables as these may readily be plotted and expressed in the form of graphs in which the amounts of the traits are measured along the base line from the lowest amount on the left to the highest amount on the right, and the number of cases for each amount are measured by the heights of the vertical lines or columns. (Figures B and C.)

The same general law of distribution is found more or less applicable to grades in the subjects of study in the secondary school, although a number of factors tend to make such distributions complex. Some sample distributions of high-school grades will illustrate the operation of the law. (Table XXVIII.)

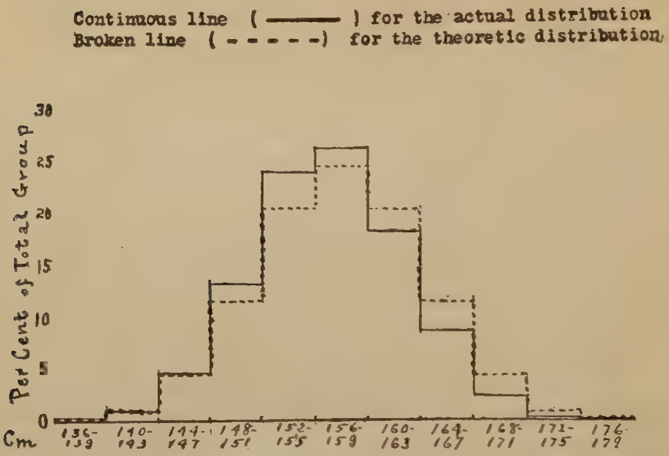

FIGURE B. ILLUSTRATING THE DISTRIBUTION, GIVEN IN TABLE XXV, OF THE HEIGHTS OF 1171 SIXTEEN-YEAR-OLD GIRLS

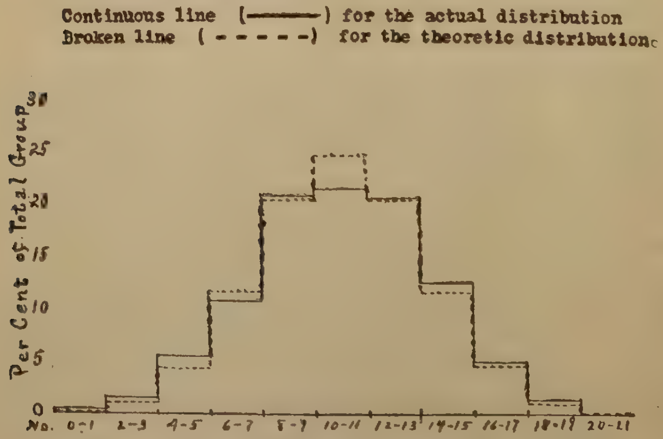

FIGURE C. ILLUSTRATING THE DISTRIBUTION OF ARITHMETICAL ABILITIES, GIVEN IN TABLE XXVII, OF 996 HIGH-SCHOOL PUPILS

TABLE XXVIII. DISTRIBUTION OF HIGH-SCHOOL GRADES*

Percentile grade	*English grades 244 pupils Madison (Wis.) High School*		*Mathematics grades 181 pupils Madison (Wis.) High School*		*Average grades 472 pupils eight high schools*	
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
70–71	1	0.4	0	0.0	1	0.2
72–74	4	1.6	4	2.2	0	0.0
75–77	17	7.0	14	7.7	18	3.8
78–80	42	17.2	25	13.8	80	17.0
81–83	50	20.5	26	14.4	92	19.5
84–86	51	20.9	34	18.8	101	21.4
87–89	43	17.6	28	15.5	86	18.2
90–92	24	9.9	25	13.8	64	13.6
93–95	11	4.5	21	11.6	27	5.7
96–98	1	0.4	4	2.2	3	0.6
99–100	. . .	. . .	0	0.0	. . .	. . .
Total	244	100.0	181	100.0	472	100.0

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* Tables and the following graphs compiled from data given in Dearborn, W. F., *The Relative Standing of Pupils in the High Schools and in the University*, Bulletin of the University of Wisconsin, no. 312, Plates V, A, C, I, A.

These figures are reduced to the form of graphs as follows.

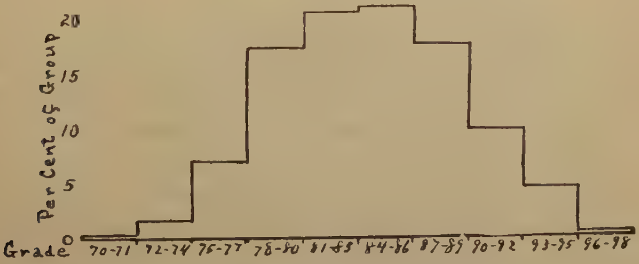

FIGURE D. ILLUSTRATING THE DISTRIBUTION OF GRADES IN ENGLISH, GIVEN IN TABLE XXVIII.

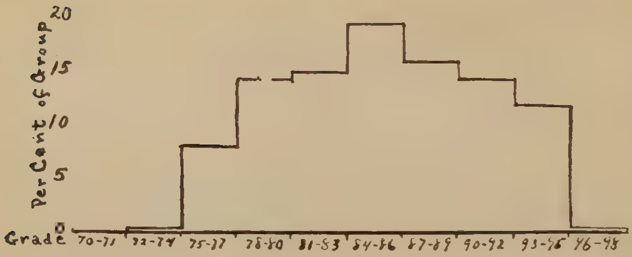

FIGURE E. ILLUSTRATING THE DISTRIBUTION OF GRADES IN MATHEMATICS, GIVEN IN TABLE XXVIII

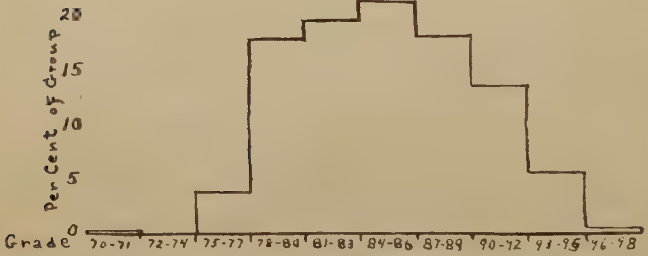

FIGURE F. ILLUSTRATING THE DISTRIBUTION OF AVERAGE HIGH-SCHOOL GRADES, GIVEN IN TABLE XXVIII

In stating the law governing the normal distribution of various amounts of a given trait, two conditions were made — that normal distribution will not appear if too few cases are taken to permit the operation of the law of chance and that the distribution will not be "normal" if any selective factor is involved. If a small number of individuals is measured different amounts of the trait will be scattered irregularly, sometimes with gaps where no individual's record is found. This is illustrated in the following table and figure.

TABLE XXIX. DISTRIBUTION OF THE GRADES OF 26 PUPILS IN HISTORY: FIRST YEAR OF HIGH SCHOOL*

Grades	*Number of Cases*	*Grades*	*Number of Cases*
70–74	6	85–89	5
75–79	2	90–94	6
80–84	0	95–100	7

* Compiled from Gray, C. T., *Variations in the Grades of High-School Pupils*, p. 12.

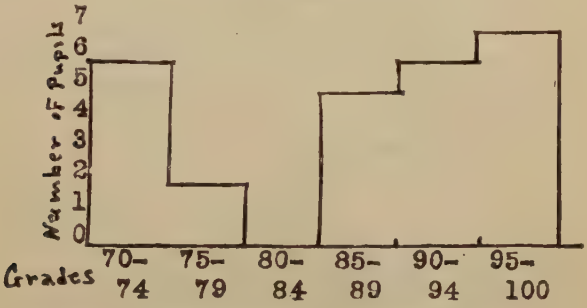

FIGURE G. ILLUSTRATING THE DISTRIBUTION GIVEN IN TABLE XXIX

Such is the usual condition in any recitation group in the secondary school, and an irregular distribution must be expected in most pupil groups where less than one hundred pupils are involved. The greater the number of pupils considered, other things being equal, the greater the likelihood that the distribution will approximate the normal.

The second factor which conditions the operation of the law of probability distribution is the factor of selection. Whenever any group of pupils is selected on the basis of the amount of a given trait possessed the result is a lop-sided or "skewed" form of distribution in which one or both ends of the distribution are lopped off. Thus, if the pupils whose records are represented in Table XXVIII and Figure F were separated into three groups on the basis of their average grades, with the dividing lines at 80 per cent and 90 per cent (assuming that the grading really represented abilities), we should then have three groups in which the distributions would appear as in Table XXX and Figure H. Theoretically something of this sort takes place through our system of promotion, except that the division is commonly in two divisions only. However, owing to the inadequacies of our grading and promotion systems the separation is always incomplete so that the overlapping of distributions is always great. This is clearly seen from the distributions of arithmetical abilities in the various grades of the high school as measured by Courtis.[1]

TABLE XXX

			Cases	
		Grade	No.	%
I	Grades 70-80 No.Cases 99 % Cases 21.0	70-71	1	0.2
		72-74	0	0.0
		75-77	18	3.8
		78-80	80	17.0
II	Grades 81-89 NoCases 279 % Cases 59.1	81-83	92	19.5
		84-86	101	21.4
		87-89	86	18.2
III	Grades 90-98 No.Cases 94 % Cases 19.9	90-92	64	13.6
		93-95	27	5.7
		96-98	3	0.6

FIG. H.

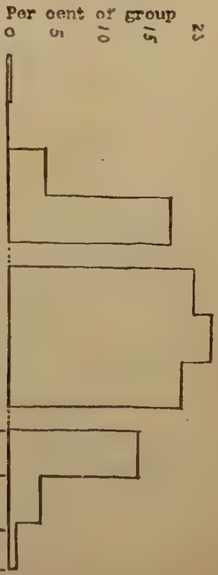

TABLE XXX AND FIGURE H. ILLUSTRATING THE DISTRIBUTION ABILITIES IN GROUPS WHERE SELECTION IS INVOLVED

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[1] Courtis, S. A., *loc. cit.*

23. The interpretation of measures. In measuring the abilities of a group of secondary-school pupils common practice utilizes a measure for the central tendency only — for that purpose ordinarily employing the average.[1] From what has been said of the character and distribution of different degrees of a variable trait such as is commonly involved in school work, it may be seen that a measure of the central tendency alone (e.g., the average) may be a very untrustworthy guide and lead us to leave very important facts out of consideration. How unsatisfactory a measure of the central tendency alone may be can be seen from the three sample distributions given in Table XXXI, each of which has the same average, median, and mode, but differs in many other important respects.

From such possible forms of distribution as those indicated in this table, each of which has the same central tendency as the others, but differs radically in the form of distribution and the amount of variability, it may be seen that the only real method of indicating the character of the group is through a table of total distribution. Ordinarily, however, it is sufficient for all practical purposes to indicate the central tendency by means of the average or median, and in addition to indicate some measure of the variability by means of the average deviation, median deviation, or standard deviation. Most secondary-school matters are determined erroneously on the basis of group averages and fail to be adapted to important differences in the pupil groups.

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[1] Other measures of the central tendency are the *median* = the record above which and below which is an equal number of all the cases, and the *mode* = the measure most commonly occurring in the measurement of the group. For the technical terminology and the technique of applying these measures consult Whipple, G. M., *Manual of Mental and Physical Tests*, chap. II; or Thorndike, E. L., *Mental and Social Measurements;* or Rugg, H. O., *Statistical Methods Applied to Education.*

Table XXXI. Three Hypothetical Distributions illustrating the inadequacy of the Central Tendency as the Sole Measure of a Variable Trait

Record	*Case A Frequency*	*Case B Frequency*	*Case C Frequency*	
0	0	8	9	
10	0	12	17	
20	0	20	1	
30	0	8	10	
40	32	2	1	
50	36	0	20	
60	32	2	2	
70	0	8	8	
80	0	20	13	
90	0	12	15	
100	0	8	4	
Total number	100	100	100	
Average record	50	50	50	Central Tendency
Median record	50	50	50	
Modal records	50	20 and 80	50	
Average deviation	0.64	3.32	2.74	Variability
Median deviation	0.22	2.75	2.64	
Standard deviation	0.08	3.48	3.22	

24. The causes of individual differences. Many causes combine to produce the individual differences found among secondary-school pupils and they affect the theory and practice of secondary education in several important ways. A brief analysis of the major factors or groups of factors involved, together with their implications for secondary education, forms the basis of the remaining portion of this chapter. The factors to be considered are as follows: (1) biological heredity; (2) social heredity; (3) maturity; (4) environment and training; (5) sex. The classification is an arbitrary one designed to facilitate analysis, and the factors suggested are not mutually exclusive in all cases, e.g., social heredity is in reality a part of environment and training and is separated therefrom merely for convenience in handling the topic.

A glance at the list given at once suggests a multitude of important problems for secondary education. Some of the problems connected with maturity have already been considered in the previous chapters. Biological heredity (parental and racial) involves problems arising out of the racially heterogeneous character of our population as well as including those arising out of the fact that each pupil represents a distinct problem. Closely connected with problems arising out of racial heredity and parental heredity in the biological sense are problems arising out of the factor of social heredity, particularly important in our miscegeneous and heterogeneous population. The problems arising out of differences in other environmental factors cover the entire economy of the secondary school. Finally, it will be recognized that individual differences due to sex introduce all the problems involved in questions of segregation, coeducation, etc.

25. **Common errors in interpreting differences.** Certain errors are so common in the interpretation of individual differences among secondary-school pupils that they deserve mention here.

(1) Analogies between individual differences in physical traits and individual differences in mental traits are dangerous unless supported by more direct evidence. The error is common of assuming important differences in mental traits because of easily observed differences in physical traits among pupils of different races, sex, or degrees of physical maturity.

(2) Care must be taken to distinguish between differences which are due to inborn tendencies and those which are due to environment and training. The former may be

accepted as relatively fixed factors to which education must conform. The latter must be considered as acquired and, therefore, subject to modification through education. Nature must be accepted: the environment and training may be controlled. This point is important in connection with differences due to biological heredity and social heredity and in connection with sex differences.

(3) The existence of differences among pupils does not necessarily imply the necessity or desirability of adapting secondary education to them. In many cases the demands of highly artificial conditions of life may demand like education for the very purpose of diminishing those differences. In other cases differentiated education is both necessary and desirable.

(4) Lack of differences does not necessarily justify the same form of secondary education for all. Differences in future needs will commonly justify differences in secondary education for different groups of pupils.

(5) The indirect and contingent results of certain original differences must not be confused with those directly and necessarily involved. Sex differences in physical traits, for example, frequently cause differences in the social treatment of boys and girls, which in turn cause differences in mental attitudes which create actual differences in mental traits between the sexes. Such differences must be considered as contingent and not necessary results. Like treatment of boys and girls might well eliminate many sex differences now found which are the results of unlike treatment. This may or may not be desirable. The same principle also applies to many so-called racial differences. Doubtless many observable traits which we note in certain races in America are due solely or primarily to the social treatment to which they are subjected. Many of these secondary education should aim to eradicate.

(6) The fallacy of unfair selection always lurks in the path of the investigator of individual differences among pupils. A comparison, for instance, of the school records of pupils of different nationalities almost always involves a difference in selection.

26. Individual differences due to biological heredity. That individual differences in physical traits are determined primarily by heredity is readily recognized. That mental traits also are largely determined by heredity is not so readily recognized, though probably no less true. In the case both of physical and of mental traits it must be conceived that the limit which a trait may reach in any given individual is determined by heredity. Within the range from zero to that limit what status the individual may reach is more or less determined by the environment and by training, which is, however, within limits, more potent in the case of mental traits than in the case of physical traits.

Among secondary-school pupils there can be no doubt that the great amount of variability found is due primarily to differences in the parentage and ancestry of those pupils. Since each individual pupil represents an independent problem the importance of individual differences is emphasized. The impossibility of definite analysis of individual differences due to differences in immediate or parental heredity (where each individual or family group of individuals must, from the nature of the case, constitute a separate problem and therefore defy generalization) tends to influence us to generalize on the basis of remote or racial inheritance. Such procedure is likely to lead either to an overemphasis or an underemphasis of the importance of racial differences with reference to the treatment of secondary-school pupils. This is likely to happen for one or both of two reasons. In the first place, any attempt to analyze racial groups for the purpose of discovering racial differences meets with an initial difficulty in the fact that intermarriage has so extensively affected population in all countries, but particularly in America, that careful distinction is in most cases totally impossible even where differences in nationality would appear to indicate differences in race. In the second place, it must be remembered that in all probability differences found among individuals of the same racial ancestry are commonly so great as to swallow up the differences between any two racial groups of importance in our secondary schools *as far as differences due to biological heredity alone are concerned, and except in so far as differences due to natural heredity may indirectly lead to important differences in social heredity and environment.* This may be illustrated by the grades in English received by 149 white and 149 negro pupils in the high schools of New York City.

TABLE XXXII *

Grades received	*White Pupils*		*Negroes*	
	Number	*Per cent*	*Number*	*Per cent*
0–29	1	0.7	0	0.0
30–39	2	1.3	2	1.3
40–49	4	2.7	13	8.7
50–59	14	9.4	44	29.5
60–69	73	49.0	67	45.0
70–79	39	26.2	16	10.8
80–89	13	8.7	7	4.7
90–100	3	2.2	0	0.0
Total	149	100.0	149	100.0
Average grade A.D.	66.8 % 7.45		61.3 % 7.25	

* Compiled from Mayo, M. J., *The Mental Capacity of the American Negro*, p. 30.

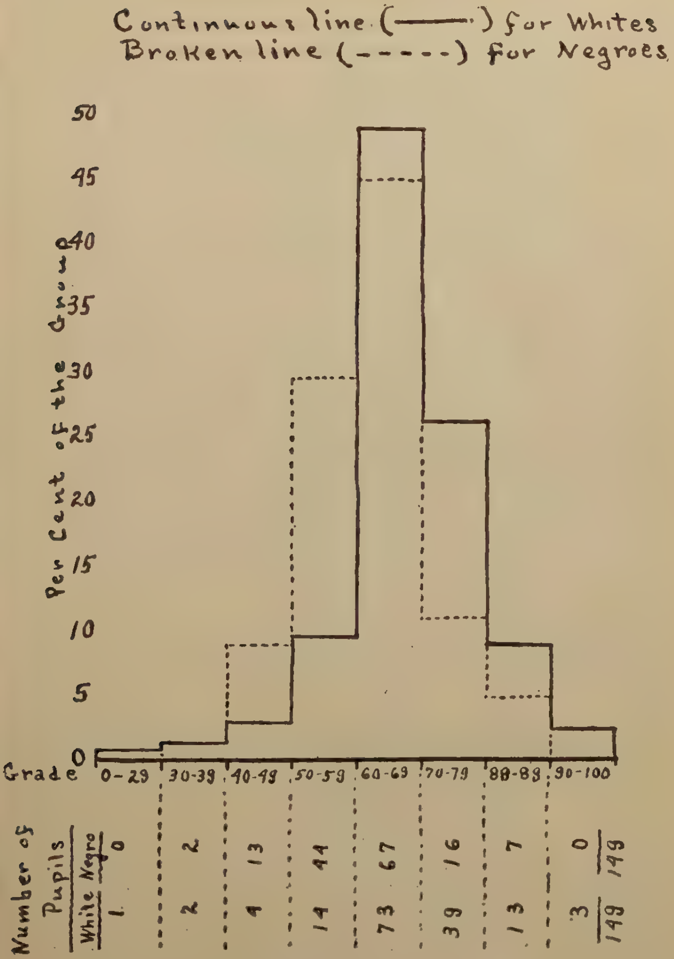

FIGURE I. ILLUSTRATING TABLE XXXII

This table and the accompanying graph are presented here, not as indicating the relative status of white and negro pupils in the secondary school, but to illustrate the fact that where differences in the average attainment of two different groups are as wide as 66.8 (for whites) and 61.3 (for negroes), and the variability much the same, the overlapping is so great that the differences between whites and negroes is swallowed up by the differences between the whites themselves or between the negroes themselves. In general the statement made by Thorndike is in point:

> My own estimate is that greater differences will be found in the case of the so-called "higher" traits, such as the capacity to associate and to analyze, thinking with parts or elements, and originality, than in the case of sensory and sensori-motor traits, but that there will still be very great overlapping. Calling the difference between the original capacity of the lowest congenital idiot and that of the average modern European 100, I should expect the average deviation of one pure race from another in original capacity to be below 10 and above 1, and the difference between the central tendency of the most and the least gifted races to be below 50 and above 10. I should consider 3 and 25 as reasonable guesses for the two differences.
>
> Even if the differences were far larger than these, the practical precept for education would remain unchanged. It is, of course, that selection by race of original natures to be educated is nowhere nearly as effective as selection of the superior individuals regardless of race. There is much overlapping and the differences in original nature within the same race are, except in extreme cases, many times as great as the differences between races as wholes.[1]

The fact is, of course, that the secondary school, in so far as its selective function operates, selects individuals on a basis which is roughly the same for all who enter or attempt to enter, with the result that if races differ essentially their representatives in the secondary school indicate different forms of selection with reference to race. This may be seen from the following hypothetical diagram:

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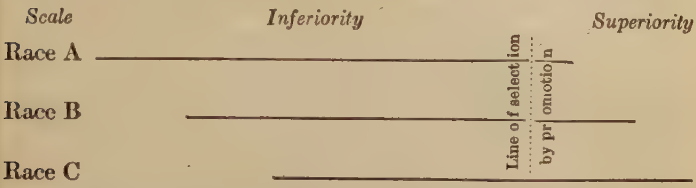
[1] Thorndike, E. L., *Educational Psychology*, vol. III, p. 224. Quoted with the permission of the publishers, Teachers College Bureau of Publications.



Thus it is quite probable that the negroes in the secondary school represent a much more select portion of that race than the selection of whites represented by white children in the school. Hence it follows that secondary-school pupils of a race, which as a whole may be considered of inferior mental capacity, are not necessarily themselves inferior to secondary-school pupils belonging to a race which as a whole may be considered of superior mental capacity. Certainly it is most unsafe to assume certain characteristics of a race and to assume that those characteristics will be found in all representatives of that race in the secondary school.

On the whole, it is probably safe to say that whatever importance for secondary education is to be attached to individual differences due to race considered from the standpoint of biological heredity, far greater importance is to be attached to race influence as conditioning the social heredity and differences in the environment — indirect rather than direct results. As a matter of fact it is extremely difficult, if not quite impossible, to separate these factors, just as it is extremely difficult always to separate the results of heredity and environment and training.

Perhaps the nearest approach to exceptional differences due to racial heredity for any large group of secondary school pupils may be found in the cases of negroes and whites. Mayo has measured the accomplishment of 150 negroes in the high schools of New York City and compared it with that of a like number of white pupils chosen at random. The results of his study are given in Table XXXIII. It must be remembered in interpreting the table that the negroes represent a relatively high selection of their race and that intermarriage with whites has more or less modified the racial stock.

TABLE XXXIII *

Grades	*English*		*Foreign Languages*		*Mathematics*		*Science*		*History*		*Ancient Languages*		*Commercial Subjects*		*All Subjects*	
	W.	*C.*	*W.*	*C.*	*W.*	*C.*	*W.*	*C.*	*W.*	*C.*	*W.*	*C.*	*W.*	*C.*	*W.*	*C.*
Below 20	1	0	3	2	1	6	0	0	0	0	0	0	1	0	0	0
20– 24	0	0	0	0	1	2	0	1	0	1	0	1	0	0	0	1
25– 29	0	0	0	2	0	0	1	0	0	1	0	1	0	0	0	0
30– 34	1	1	2	2	5	4	0	4	0	2	2	2	0	0	1	0
35– 39	1	1	5	2	3	6	0	3	1	0	4	0	2	2	1	0
40– 44	3	4	4	5	3	9	4	5	3	4	1	3	0	2	3	5
45– 49	1	9	5	18	8	7	3	8	1	7	1	5	2	1	0	3
50– 54	9	19	15	15	10	18	5	13	3	14	2	7	3	3	8	16
55– 59	5	25	16	21	17	23	16	14	8	15	4	9	1	13	9	23
60– 64	36	39	36	31	26	27	27	35	22	15	16	14	6	9	46	49
65– 69	37	28	23	19	22	17	23	18	20	12	13	5	4	9	29	34
70– 74	28	10	19	10	11	11	28	16	16	11	9	6	7	6	29	4
75– 79	11	6	12	6	17	7	17	9	6	3	6	2	7	2	7	6
80– 84	10	4	4	5	11	3	5	4	4	4	1	2	6	1	8	4
85– 89	3	3	4	2	6	3	1	0	3	3	2	2	2	1	1	1
90–100	3	0	2	0	2	4	1	0	0	0	1	0	2	1	3	1
Cases	149	149	150	140	143	147	131	130	87	92	62	59	43	50	150	150
Median	67	61	63	60	64	59	67	61	66	60	65	60	70	62	66	62
M.D.	4.5	5.4	6.0	7.8	7.4	7.4	3.0	5.8	4.5	7.3	3.9	7.3	7.7	3.6	4.0	2.6
Per cent of C. surpassing Median of W.	24		33		46		29		31		27		22		29	

* Compiled and arranged from Mayo, M. J., *The Mental Capacity of the American Negro*, especially pp. 26–45. W. = white pupils: C. = negroes.

From this table it may be noted that while the white pupils invariably show a higher average standing than the negro, the difference in the medians ranges only from 4 to 8, and that for all subjects the averages indicate a difference of four points. It is further to be noted that about thirty per cent of the negroes reach or surpass the median record for the white pupils. In view of these facts it cannot be said that the white pupils in the high school excel the selected negroes found there to an extent to justify any appreciable differences in accomplishment or expectation in high-school work.

If this is true when comparing whites and negroes, it is, of course, probably even more in point when the comparison is made between the various white stocks.

27. Individual differences due to social heredity. One important group of environmental forces includes all those social customs, conventions, institutions, modes of thought, action, and feeling to which the individual falls heir by virtue of being born into any given society or social grouping. This set of forces we may well differentiate from other environmental forces under the term social heredity. An important factor causing individual differences in any society, social heredity is especially important in such a country as the United States where large groups of individuals of widely differing forms of social heredity form constituent elements of one larger social group.

According to the census of 1910 the distribution of population in the United States was as follows:

TABLE XXXIV*

	Number	*Per cent*	*Number*	*Per cent*
Native white	....	....	68,389,104	74.4
Native parentage	49,488,441	53.8	....	....
Foreign-born parentage	18,900,663	20.6	....	....
Foreign-born white	....	....	13,343,583	14.5
Negro	....	....	9,828,294	10.7
All others — Indians, etc.	....	....	411,285	0.4
Total	....	....	91,972,266	100.0

* *Thirteenth Census* (1910), vol. I, p. 132.

It is a fact not without significance for secondary education that only a little more than one half of the population of the United States is of native white parentage and that the proportion has constantly decreased for a number of decades. This may be noted from the following table.

TABLE XXXV *

	1850 (per cent)	*1860 (per cent)*	*1870 (per cent)*	*1880 (per cent)*	*1890 (per cent)*	*1900 (per cent)*	*1910 (per cent)*
Foreign-born........	9.7	12.0	14.2	13.1	14.5	13.4	14.5
Native: foreign-born parentage........	...	...	13.8	16.5	18.3	20.6	20.6
Total foreign parentage.........	......	......	28.0	29.6	32.8	34.0	35.1

* *Thirteenth Census* (1910), vol. I, p. 132.

This condition apparently more or less affects the number of children of various ages who continue their education into the secondary school.

TABLE XXXVI. SHOWING THE PERCENTAGES OF CHILDREN OF VARIOUS AGE GROUPS ATTENDING SCHOOL — NATIVE AND FOREIGN STOCKS: 1909–10 *

Years of Age	*Native White*			*Foreign-born whites*	*Negro*
	Total	*Native Parentage*	*Foreign or Mixed Parentage*		
12	93.1	92.0	95.6	90.2	70.1
13	91.9	90.9	94.2	87.7	68.4
14	84.7	85.3	83.1	71.6	62.3
15	71.5	75.0	63.5	46.2	53.9
16	53.7	58.9	41.8	23.7	41.5
17	38.0	42.9	26.7	12.2	29.0
18	25.1	28.6	16.9	6.8	17.9

* *Thirteenth Census* (1910), vol. I, p. 1099.

It is, of course, in the field of derived and acquired interests, attitudes, ideals, customs, standards, modes of thought, action, and feeling, that we may expect to find the greatest differences among secondary-school pupils due to differences in social heredity. It is probable that English, American, Russian, Italian, French, Hebrew, and other races do not differ materially in original tendencies and capacities. It is obvious, however, that they do differ materially in acquired interests, attitudes, and the like. In general we may say that individual differences among secondary-school pupils due to biological heredity are relatively unimportant, but that individual differences due to social heredity are great and important. The greater the number of groups of differing social heredity combined in any one society and the greater the differences in the customs, ideals, standards, modes of thought, action, and feeling of the various groups thus combined, the greater the individual differences we may expect to find due to the factor of social heredity and the more important they become. In 1850 the population of the United States, while by no means homogeneous, nevertheless comprised a relatively small number of different nationalities, and those nationalities were for the most part such as could be classified as "English-speaking" or, at least, as in general represented the social ideals, etc., of Northern Europe. Within the past half-century or less that condition has been modified rapidly, as may be seen from Table XXXVII.

Division of the foreign-born population into English-speaking and non-English-speaking groups is here made not merely to emphasize the language factor, important though it is, but also because such groupings indicate in the case of the English-speaking population social heredity which is roughly homogeneous and similar to the basic American stock, and in the case of the non-English-speaking popula-

TABLE XXXVII. DISTRIBUTION OF THE FOREIGN-BORN POPULATION *

	1850	*1870*	*1890*	*1910*
United States: English-speaking	66.3	56.0	42.4	28.1
Non-English speaking	33.7	44.0	57.6	71.9
Massachusetts: English-speaking	95.2	93.4	71.7	47.5
Non-English speaking	4.8	6.6	28.3	52.5

* Compiled and arranged from data given in the *Thirteenth Census* (1910).

tion, forms of social heredity which differ from that of the basic American stock and are decidedly heterogeneous. In the one case the integration of American society is relatively easy: in the other it is very difficult. In the case of the English-speaking population the general stimulus of life in American society may, perhaps, be relied upon to contribute extensively to the development of that degree of homogeneity, of unity and unanimity, necessary for the permanence of American institutions. In the case of widely differentiated foreign stocks such as are represented by the non-English-speaking groups, it is probable that the school must be relied on to a much greater extent, involving a longer period of education and an education which should aim definitely toward the integration of large groups of different forms of social heredity.

It has frequently been thought that the problems arising out of immigration are concerned largely with elementary education. Important as those problems are for elementary education they are by no means confined to it. Numerous important problems are also involved for secondary education. It has long been recognized that some of the gravest problems arising out of immigration center around the second generation of aliens. The first generations of aliens bring with them from their native lands ideals, standards, habits of thought, feeling, and action, which, to be sure, differ from our own and from each other, but which are, nevertheless, good ideals, standards, and habits for the most part. Good or bad they are controlling forces in the lives of immigrants. The second generation abandon the standards, ideals, and habits of their parents and frequently fail to replace them with American traits. This is the group which tends in increasing numbers to reach the secondary school and it forms a larger group than is generally recognized. Thus in 1908 it was found that 55.7 per cent of the pupils in the high schools of New York City were of foreign parentage, and that more than fifty different countries were represented by high-school pupils.[1]

In the following table are presented figures showing the parentage of school children in Worcester, Massachusetts, for two decades.

TABLE XXXVIII *

Parents born in	*1895*	*1900*	*1905*	*1910*	*1915*
United States.....	7,183	8,576	8,703	8,424	9,486
Canada...........	1,230	1,752	1,356	1,268	1,440
Ireland...........	3,136	3,339	2,952	2,502	2,490
England..........	815	923	825	760	833
Sweden...........	1,684	2,555	2,837	2,647	2,716
Russia...........	321	713	1,237	2,031	3,526
Italy.............	...	156	258	569	1,150
Finland..........	...	117	170	335	527
All others.........	886	1,002	1,090	1,254	1,617
Totals.......	15,255	19,133	19,428	19,790	23,785
United States.....	47.1%	44.8%	44.8%	42.6%	39.9%
All others.........	52.9%	55.2%	55.2%	57.4%	60.1%

* *Sixty-eighth Annual Report of the Public Schools of Worcester, Massachusetts* (1916), p. 555.

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[1] Van Denburg, J. K., Causes of Elimination of Students in Public Secondary Schools of New York City, pp. 32–38.

Such figures as those given in this table (and the situation is by no means extreme in Worcester) suggest the importance of recognizing differences among school children in social heredity. They emphasize the importance of some phases of the work of the secondary school which are designed to operate as integrating forces.

28. Individual differences due to environment. It is unfortunately true that pupils receiving the benefits of secondary education are selected on the basis of economic and social status as well as, if not more than, on the basis of intellectual fitness. It is also unfortunately true that for many pupils who do attend the secondary school, conditions of the home and community environment are such as to handicap them seriously in their studies. The complexity of environmental conditions precludes any satisfactory analysis other than for special localities. Here we have three studies which afford us more or less knowledge.

Holley[1] made a study of the pupils in the Decatur, Illinois, High School, dividing 198 families investigated into three groups as follows: Group I: those from which all the older children had completed the high-school course (78 families, 72 per cent of 334 children who had secured a high-school education); Group II: those from which none of the older children had completed the high-school course (59 families, 57 per cent of the 308 children who had not finished high school); Group III: those in which some of the older children had graduated from the high school, while some had not graduated. By the questionnaire method Groups I and II were compared with the following results:

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[1] Holley, C. E., *The Influence of Family Income and Other Factors on High-School Attendance.* (Pamphlet published by the University of Illinois, School of Education, Seminary in Educational Administration.) Cf. Holley, C. E., "The Relationship between Persistence in School and Home Conditions," *Fifteenth Yearbook of the National Society for the Study of Education,* part II.

Environmental Circumstance	*Group I*	*Group II*
a. Occupation of father	Chiefly professional or commercial.	Chiefly artisan, semi- or un-skilled.
b. Median years education of parents	12 years: 60 % had high school education.	8 years: 71–74% not further than eighth grade.
c. Yearly income (median)	$2,000	$1,350
Monthly rental (median)	27.50	20.00
d. Good magazines	Frequently	Infrequently
Books in library (median)	271	83

While it is clear that economic status is an important factor in determining whether, in the community that we studied, a child shall or shall not receive a high school education, it does not follow that economic status is directly correlated with intellectual ability. In so far as mental ability is measured by standing in high school subjects, the differences in ability between children of the two groups are insignificant. The average semester's grade for children of Group I was 85.1 per cent; for children of Group II, 84 per cent. A difference so slight as this could justify only the conclusion that, measured by this standard, the two groups are of approximately equal ability.

On this last point raised by Holley we must remember that if economic and other environmental conditions operate to exclude poorer children from the secondary school, then those poorer children who do go to the secondary school probably represent a somewhat higher selection of poorer children.

Van Denburg's study of conditions found in the case of high-school pupils in New York City indicate conditions somewhat different from those found in Decatur by Holley. The monthly rentals paid by the families of 420 children entering the high schools in 1908 were distributed as given in Table XXXIX.

TABLE XXXIX*

Monthly rental	*Per cent of pupils*	*Monthly rental*	*Per cent of pupils*
$10–$15	45	$40–$45	6
20– 25	26	50– 55	2
30– 35	12	60– 65	2
		70–150	7

* Van Denburg, J. K., *Causes of the Elimination of Students in Public Secondary Schools of New York City*, pp. 79–83.

> On the whole the economic status of these pupils (so far as is shown by the monthly rental) seems to be only a slight factor in the determination of length of stay in the high school. . . . We saw in an earlier section that children remain through the elementary school and enter high school from homes of the most meager financial resources. We now find that such children remain in high school as long or nearly as long as do children whose parents pay $40 or more a month for rent.[1]

Van Denburg also found that 827 fathers of high school pupils were engaged in 126 different occupations, an average of about seven to each occupation listed and seven occupations listed enrolling twenty-five or more fathers.[2] Of older brothers and sisters 556 were engaged in 164 listed occupations other than study in school or college. Of those, two occupations only engaged twenty-five or more brothers or sisters.[3] The occupations of fathers are summarized by Van Denburg. (Table XL.)

The figures shown in Table XL may be compared with the figures obtained by King for 1123 high-school pupils in three cities in Iowa. (Table XLI.)

With references to most categories the likenesses for the

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[1] Van Denburg, J. K., *op. cit.*, pp. 113–14. [2] *Ibid.*, pp. 39–48.

[3] *Ibid.*, pp. 59-68. These and other quotations from Van Denburg are made with the permission of the publishers, Teachers College Bureau of Publications.

TABLE XL. OCCUPATIONS OF FATHERS (NEW YORK CITY)*

Occupations	*Total number*	*High School 1906 (per cent)*	*Population 1900 (per cent)*
Professional	36	4.4	2.3
Semi-professional	36	4.4	3.7
Artisans — contractors	150	18.1	16.4
Federal and city employees	61	7.4	3.6
Clerical helpers	52	6.3	11.2
Office workers, agents	106	12.8	7.9
Manufacturer and trade	227	27.5	28.1
Printing trades	35	4.2	2.5
Personal service	41	4.9	7.7
Transportation	46	5.5	6.6
Factory — labor	36	4.4	10.0
Total	826	100.0	100.0

* Van Denburg, J. K., *op. cit.*, pp. 44, 128.

two types of communities are greater than one would expect. The greatest difference, of course, is found in the case of agriculture in the Iowan cities. (Table XLI.)

29. Individual differences in interests, etc. Individual differences among secondary-school pupils due to differences in interests, life aims, school motives, and the like, are obviously important factors in the work of the secondary school. They are, to be sure, the resultants of differences in heredity and environment, but deserve special attention here as important elements determining both theory and practice in the secondary school. The multiplexity and complexity of those differences preclude any extensive analysis. However, the occupational preferences of secondary-school pupils and their attitudes toward school work are important enough to justify brief consideration.[1]

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[1] For some excellent studies see King, I., *The High-School Age*, chaps. x–xii.

TABLE XLI. FATHERS' OCCUPATIONS OF 1123 PUPILS IN IOWA, 1913, AND OF 1004 IN NEW YORK CITY, 1906*

Occupations	*Iowa*		*New York City*	
	Number	*Per cent*	*Per cent*	*Number*
Agriculture	151	13.46	0.00	0
Trade and Manufacturing	268	23.88	22.62	227
Artisans	156	13.80	14.80	150
Middlemen and office workers	92	8.20	10.57	106
Transportation	75	6.69	4.59	46
Professional	93	8.29	3.60	36
Semi-professional	19	1.70	3.60	36
Clerical	30	2.68	5.19	52
City and federal employees	40	3.57	6.09	61
Personal service	18	1.60	4.09	41
Printing trades	10	.89	3.50	35
Unclassified	51	4.54	3.60	36
Blank	63	5.62	8.86	89
Retired	17	1.51	1.30	13
Dead	40	3.57	7.57	76
Total	1,123	100.00	100.00	1,004

* King, I., *The High-School Age*, p. 159. Quoted with the permission of the author and his publishers, The Bobbs-Merrill Company.

Van Denburg secured data from 382 boys and 620 girls entering the high schools of New York City in answer to the question: " What do you expect to do for a living?" Of the boys 156 (41 per cent) made no choice, 15 (4 per cent) made a partial choice, 211 (55 per cent) made a somewhat definite choice. Of the girls 316 (51 per cent) made no choice, 26 (about 4 per cent) expected to go to college, and 278 (45 per cent) made a somewhat definite choice.[1] The distribution of occupations was very wide and scattering. Occupations chosen by two or more per cent of those who expressed a choice are shown in Table XLII.

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[1] Van Denburg, J. K., *op. cit.*, pp. 49–57.

TABLE XLII *

Boys			*Girls*		
Occupations	*No.*	*Per cent*	*Occupations*	*No.*	*Per cent*
Architect	7	3.3	Bookkeeper	9	3.2
Business	36	17.0	Designer	6	2.1
Electrician	9	4.2	Dressmaker	7	2.5
Engineer	5	2.3	Musician	7	2.5
Engineer, civil	39	18.4	Stenographer	46	16.9
Engineer, electrical	27	12.7	Teacher, school	167	60.0
Engineer, mechanical	5	2.3	Teacher, music	12	4.3
Law	24	11.4	Scattering	24	8.6
Medicine	7	3.3			
Teacher	11	5.2			
Miscellaneous trade	8	3.7			
Miscellaneous construction	14	6.6			
Scattering	19	9.0			
Total	211	100.0	Total	278	100.0

* Van Denburg, J. K., *op. cit.*, pp. 51, 55. Slight percentage inaccuracies in original tables uncorrected.

King compares the figures for the pupils in the high schools of New York City with those for three fairly large high schools in Iowa and also gives figures for three small high schools in Iowa. (Table XLIII.)

The fact that approximately one half of the pupils entering the New York City high schools were as yet undecided as to their future vocations is indicative of the fact that the work of the elementary school has not been able to develop life interests, and that in most of those cases such dominant interests will be formed during attendance at the secondary school. Hence emphasis is placed on the work of the first years of the secondary-school course as affording opportunity for the discovery of interests and their cultivation. King found that more than three quarters of pupils in all grades of three Iowa high schools had decided on definite vocations.[1]

[1] King, I., *The High-School Age*, p. 162.

TABLE XLIII. VOCATIONS CHOSEN BY PUPILS IN THE HIGH SCHOOLS OF IOWA AND OF NEW YORK CITY *

Occupations chosen	*Three large high schools in Iowa*		*Three small high schools in Iowa*		*New York City high schools*	
	Boys	*Girls*	*Boys*	*Girls*	*Boys*	*Girls*
Teaching	13	261	2	69	11	168
Engineering	94	...	17	...	78	...
Stenography and bookkeeping	16	85	1	10	4	55
Law	32	...	...	...	24	2
Farming	34	...	35	...	1	...
Nursing	...	24	...	6	...	...
Medicine	30	3	...	...	7	1
Business	33	4	3	...	36	4
Music	...	23	...	...	1	19
Dentistry	8	...	...	...	2	...
Pharmacy	8	...	...	...	3	1
Salesman	16	...	...	...	2	...
Mechanic	8	...	4	...	...	...
Army and navy	8	...	...	...	3	...
Labor	5	...	...	...	...	...
Domestic science	...	22	...	...	...	...
Housekeeping	...	8	...	...	...	2
Librarian	...	11	...	...	...	3
Physical training	1	6	...	...	1	1
Civil service	5	1	...	...	...	...
Office work	6	5	...	...	...	2
Architecture	6	...	...	...	7	...
Millinery	...	6	...	...	...	2
Totals	323	459	62	85	180	260

* King, I., *The High-School Age*, pp. 163–64.

Van Denburg and King have collected valuable data concerning the attitudes assumed by high school pupils toward the work of the secondary school. Their figures are presented in the following tables:

TABLE XLIV. PUPILS' ESTIMATES OF THE VALUE OF A HIGH-SCHOOL COURSE *

a. New York City: "Do you consider a high-school education necessary for the realization of your plans for the future?"

	Numbers				*Per cents*		
	Total	*Yes*	*Doubtful*	*No*	*Yes*	*Doubtful*	*No*
Boys.........	382	215	66	101	56	17	27
Girls.........	620	255	135	230	41	22	37
Both.........	1,002	470	201	331	47	20	33

b. Iowan Cities: "Are four years in high school necessary for your purpose?"

	Numbers				*Per cents*		
	Total	*Yes*	*Uncertain*	*No*	*Yes*	*Uncertain*	*No*
Boys.........	534	354	87	93	66	16	18
Girls.........	533	336	84	113	63	16	21
Both.........	1,067	690	171	206	66	16	18

* Van Denburg, J. K., *op. cit.*, pp. 69–72; King, I., *op. cit.*, p. 166.

TABLE XLV. PUPILS' INTENTIONS OF STAYING FOUR YEARS IN HIGH SCHOOL †

a. New York City: "Do you intend to complete your high-school course?"

	Numbers				*Per cents*		
	Total	*Yes*	*Doubtful*	*No*	*Yes*	*Doubtful*	*No*
Boys.........	382	207	115	60	54	30	16
Girls.........	620	316	179	125	51	29	20
Both.........	1,002	523	294	185	52	29	19

† Van Denburg, J. K., *loc. cit.*; King, I., *loc. cit.*

b. Iowan Cities: "Do you intend to spend four years in high school?"

	Numbers				*Per cents*		
	Total	*Yes*	*Uncertain*	*No*	*Yes*	*Uncertain*	*No*
Boys.........	548	470	34	44	85	7	8
Girls.........	614	534	33	47	87	5	8
Both.........	1,162	1,004	67	91	87	5	8

TABLE XLVI.*

Iowan Cities: "Is a college education necessary for your purpose?"

	Numbers				*Per cents*		
	Total	*Yes*	*Uncertain*	*No*	*Yes*	*Uncertain*	*No*
Boys.........	537	337	87	113	63	16	21
Girls.........	617	297	114	206	48	19	33
Both.........	1,154	634	201	319	55	17	28

* King, I., *loc. cit.*

30. Individual differences due to sex. In the United States it is the general practice to group boys and girls together for purposes of administration and instruction, exceptions to this practice being common only in private secondary schools and in certain large cities. In most foreign countries the segregation of boys and girls is the general rule in the secondary schools. Whether coeducation or segregation be the practice important problems for secondary education arise out of the differences due to sex. In the case of segregation such problems are somewhat less complex than in the case of coeducation and less concern the individual teacher. In the case of coeducation those problems affect every phase of the work of the secondary school. It is, therefore, necessary to consider briefly certain individual differences in physical, mental, and social traits among secondary school pupils due to difference in sex.

Differences in physical traits between men and women or boys and girls, due to the sex factor, are too obvious to require extended discussion. It suffices to note a few of the more important phenomena. Thus we may note from Tables IV, V, XI, and XIII that girls apparently approach the maximum of growth in many physical traits from a year to two years before boys. From Tables IV and V we may note that from about 11.5 to about 14.5 years of age girls apparently exceed boys in height and weight, although boys excel girls in height and weight at all other ages. Likewise we may note that with reference to pubescence and adolescence girls begin to mature a year or two before boys with resultant characteristic differences. One should not fail to recognize that differences due to such physical phenomena are of especial importance in connection with secondary education, however much or however little they may affect elementary or higher education. Likewise one should not fail to note that these physical traits are but slightly amenable to education and that as far as their direct effects are concerned secondary education must be guided rather than guide. This is not so true, however, of the indirect effects of physical traits which may, and probably should be, modified by education.

Differences in mental traits due to sex may best be considered under two separate heads: (1) mental processes, such as association, memory, etc.; (2) interests, attitudes, etc. Data dealing with mental processes have already been presented in Tables XIX, XX, XXI, and XXII. In Table XIX data indicate that there is apparently little if any difference between boys and girls in their ability to discriminate weights. In Table XX data apparently indicate that boys excel girls in their ability to react quickly to a given stimulus. In Tables XXI and XXII the data indicate a practical identity of ability on the part of boys and girls in association, memory, etc. Such differences as are found in any case are negligible and probably less than differences due to the imperfection of the measurements. Essentially the same results (inappreciable differences) have been found in the great majority of investigations of mental processes. Thus Thompson measured men and women students in the University of Chicago in forty-five mental traits. In twenty-one of those traits the men excelled the women by greater or less amounts. In twenty-one traits the women excelled and in four traits they were approximately equal in ability. In the few cases where the superiority was marked on either side previous general training was quite probable. On the average the per cent of men reaching or exceeding the median for the women was fifty, thus indicating a general equality.[1]

Courtis measured 1235 boys and 1168 girls in the seventh grade of the schools of New York City in speed multiplication and in speed reasoning with the results indicated in Table XLVII.

Such differences justify the statement made by Courtis:[2]

> In view of the extent to which the sex groups overlap, the fact of a small difference in the average scores of the groups need not be considered in planning the course of study.

The same opinion is expressed by Thorndike:[3]

> The most important characteristic of these differences is their small amount. The individual differences within one sex so enor-

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[1] Thompson, Helen B., *Psychological Norms in Men and Women*, University of Chicago Contributions to Philosophy, vol. 4, no. 1. Data here taken from the résumé by Thorndike, E. L., *Educational Psychology*, vol. III, pp. 178–79.

[2] Courtis, S. A., *loc. cit.*

[3] Thorndike, E. L., *Educational Psychology*, vol. III, p. 184. Quoted with permission.

TABLE XLVII. ARITHMETICAL ABILITIES OF BOYS AND GIRLS COMPARED *

Score	(A) *Test 3 (Courtis). Per cent making the score*		Score	(B) *Test 6 (Courtis) Per cent making the score*			
				Attempts		*Rights*	
	Boys	*Girls*		*Boys*	*Girls*	*Boys*	*Girls*
5	.1	.0	0	.1	.1	2.7	4.1
15	.9	.5	1	.5	.5	9.2	15.0
25	11.7	6.7	2	4.5	5.6	16.3	23.4
35	36.6	31.0	3	13.1	14.7	19.8	20.2
45	32.4	36.9	4	19.3	19.7	19.8	16.9
55	10.5	15.1	5	23.2	23.4	15.9	11.3
65	6.2	7.0	6	19.3	18.5	8.9	5.2
75	1.1	1.0	7	9.6	7.5	4.0	2.1
85	.4	1.0	8	4.8	4.5	1.9	.9
95	.0	.3	9	2.7	1.8	.8	.3
105	.1	.3	10	1.2	1.5	.5	.3
115	.0	.0	11	.6	.9	.0	.2
125	.0	.2	12	.6	.5	.1	.1
			13	.3	.3	.0	.0
	100.0	100.0	14	.1	.0	.0	.0
			15	.0	.0	.0	.0
Average score	40.1	42.9	16	.1	.5	.1	.0
Total cases	1,235	1,168		100.0	100.0	100.0	100.0
			Average score	5.7	5.6	4.2	3.6
			Total cases	1,235	1,168	1,235	1,168

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* Compiled from Courtis, S. A., *Report of Committee on School Inquiry*, Board of Estimate and Apportionment, City of New York, vol. I, p. 526.

mously outweigh the differences between the sexes in these intellectual and semi-intellectual traits that for practical purposes the sex difference may be disregarded. So far as ability goes, there could hardly be a stupider way to get two groups alike within each group, but differing between the groups, than to take the two sexes. As is well known, the experiments of the past generation in educating women have shown their equal competence in school work of elementary, secondary and collegiate grade. The present generation's experience is showing the same fact for professional and business service. The psychologists' measurements lead to the conclusion that this equality of achievement comes from an equality of natural gifts, not from an overstraining of the lesser talents of women.

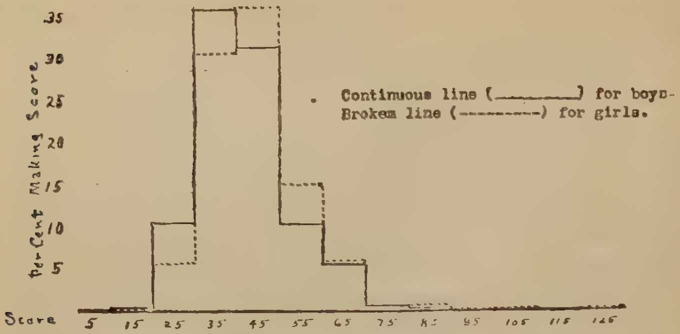

FIGURE J. ILLUSTRATING TABLE XLVII (A)

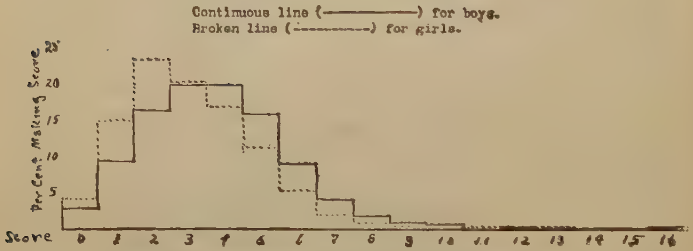

FIGURE K. ILLUSTRATING TABLE XLVII (B)

The practical equality of capacity in such mental processes as are involved in the studies of the secondary school has been sufficiently well established by the experience of the past half-century and more of coeducational practice in this country. Such differences as are found in the achievements of boys and girls in the various secondary-school subjects are probably to be ascribed to differences in interests rather than to inherent differences in capacity.

While the differences between the central tendencies for boys and girls in the case of most mental traits are apparently negligible it has been suggested that the variability of boys is greater than that of girls. Thus Thorndike:[1]

> These facts make it extremely probable that, *except in the two years nearest the age of puberty for girls*, the male sex is slightly more variable. From the time of puberty for boys to maturity this difference seems to increase rapidly, though the records of marks which support this conclusion are not the best of evidence. The variability of girls with respect to the age at which any given school grade is reached is less than that of boys. The difference is not necessarily attributable in its entirety to an original difference between the natures of boys and girls.

The evidence for this opinion is by no means satisfactory. If, however, further investigation should establish it, the greater variability of boys would mean that more boys than girls would be found both among the least capable and among the most capable pupils of any large group. Terman's studies of general intelligence lead him to the following conclusion:

> Apart from the small superiority of girls, the distribution of intelligence in the two sexes is not different. The supposed wider variation of boys is not found. Girls do not group themselves about the median more closely than do boys. The range of I Q (Intelligence Quotient) including the middle fifty per cent is approximately the same for the two sexes.[2]

Differences between boys and girls in interests and attitudes are probably of far greater extent and importance for secondary education than are differences in mental abilities. The latter are in all probability very small and their character is largely determined by original nature, plus inner growth, plus exercise through training. The mental processes may be increased through growth and exercise or, perhaps, decreased through injury or disuse. They cannot, however, be radically modified in character. Interests and attitudes are in part determined by inner nature. For the most part, however, they may be radically modified and changed through the influence of the social environment and through training. Hence it is that, even though we assume the essential equality of the sexes in all mental capacities at birth, the marked differences in the treatment and training accorded boys and girls before they enter the secondary school result in very important differences in the interests and attitudes of boys and girls in the secondary school. To this consideration must be added two further facts of importance. Interests and attitudes are determined as well by the probable character of the lives which boys and girls will follow after leaving the secondary school as by the training which they receive before and in the secondary school. That those interests are in part quite different for boys and girls is too obvious to require comment. The same may be said of their needs in life after the secondary school. The second fact of importance is that interests are for the most part somewhat general until exercised along special lines and therefore highly modifiable so that they are more amenable to the force of education than are the mental processes.

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[1] Thorndike, E. L., *Educational Psychology*, vol. III, pp. 194–95.

[2] Terman, L. M., *The Measurement of Intelligence*, p. 70.

Differences in mental abilities between boys and girls in the secondary school are probably quite negligible. Differences in interests and attitudes are great and important. Whether or not boys and girls in the secondary school should be taught and trained alike or differently will depend on the degree to which we wish them to be kept alike or be made more alike and the degree to which we wish them to be kept or made more unlike. Here Thorndike's comment is in point:

> By way of preface to an account of sex differences it is well to note that their existence does not necessarily imply in any case the

> advisability of differences in school and home training, and on the other hand, that even if the mental make-up of the sexes were identical it might still be wisest to educate them differently. It is true that a difference of two groups in a mental trait will theoretically involve differences in treatment, but practical considerations apart from that of developing the highest efficiency in that trait may outweigh the advantages of the different treatment. . . . Let us note in the second place that the existence of differences need not imply the need of different training, because those very differences may have been due to the different training actually received and might never have appeared had training been alike in the two classes. It is folly to argue from any mental condition in an individual or class without ascertaining whether it is due to original nature or to training.[1]

In certain phases of secondary education we may be sure that the aim should be to recognize differences between boys and girls in interests and attitudes by dealing with them in different ways with the intention of preserving such differences and fostering them. Such would be the case in connection with vocational interests. In other phases of secondary-school work we may be sure that differences already in evidence should be lessened, if possible, through secondary education. In any event individual differences among secondary school pupils in interests and attitudes which are due to sex must be recognized in almost every phase of secondary-school work.

PROBLEMS FOR FURTHER CONSIDERATION

1. Take the table of age-grade distribution of any secondary school. Find the per cent each age group in the first year of the school is of the total number of pupils in that grade. Compare the data with those of Table XXV. Do the same for pupils in the fourth grade of the school and compare results with those found for the first grade.
2. Make a table of distribution of the grades received by 150 or more high-school boys in any one subject of study. Do the same for 150 or more girls and compare with the first table.

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[1] Thorndike, E. L., *Educational Psychology*, vol. III, p. 169.

3. Test the efficacy of promotion in the secondary school as selecting pupils by measuring the results of any general test, e.g., an "opposites test." (Cf. Whipple, G. M., *Manual of Mental and Physical Tests*, pp. 445–46.)
4. Make a list of all the differences in mental traits you believe exist between secondary-school pupils of different races or nationalities. Indicate which of those you believe are due to biological heredity and which are due to social heredity or other environmental influence.
5. What important problems arise for secondary education out of differences in social heredity among the pupils?
6. What important problems for secondary education arise out of other phases of environmental influence?
7. Make a list of all the differences in mental traits you believe exist between boys and girls of secondary-school age. Indicate which of them you believe are due to original nature and which to environment and training.
8. In what ways does the factor of individual differences affect the general organization and administration of the public secondary school?
9. In what ways does the factor of individual differences affect the subject-matter, teaching methods, and discipline of the secondary school?
10. Compare the relative standing of the same pupils in three different subjects of study by giving each pupil a ranking according to his position in the class (1st, 2d, etc.). How many pupils maintain the same relative position in all three subjects? How many fall in the same fifth of each class?
11. Make a study of the occupational interests of pupils in each grade of any secondary school.
12. Make a study of the subject interests of secondary-school pupils.
13. How may the problem of adapting instruction to individual differences be attacked in the secondary school?

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CHAPTER IV

THE SECONDARY-SCHOOL POPULATION: ITS CHARACTER AND CLASSIFICATION

I. The Distribution of Pupils: Retardation and Elimination

31. Some illustrative figures. About a million and a half children in the United States are receiving some form of secondary education at the present time. Of that number about a million and a third are enrolled in the public secondary schools. Of the total population one individual in about every sixty-nine is attending a secondary school and one individual in about every seventy-seven is attending a public secondary school. More than one half of the children between the ages of fourteen and eighteen are attending school. These figures indicate a marked development of secondary education within the past two or three decades.

In so far as the figures in Table XLVIII may be accepted as correctly representing the facts of the case they indicate that within a period of twenty-five years the number of public secondary schools more than quadrupled, the number of pupils enrolled in the public secondary schools increased more than sixfold, and the number of teachers engaged therein increased more than sevenfold. From these facts certain conclusions may be drawn: (*a*) The figures indicate an increase in the number of pupils receiving the benefit of secondary education unparalleled in any other country. Critics of the American secondary school should bear in mind the tremendous adjustments in organization and administration required by the influx of great numbers of pupils into the

TABLE XLVIII *

	1890–91	*1900–01*	*1910–11*	*1914–15*
Public secondary schools				
Number of schools	2,771	6,318	10,234	11,674
Number of pupils	211,596	541,730	984,677	1,328,984
Number of teachers	8,270	21,778	45,167	62,519
Pupils per 1,000 population	3.4	7.1	10.9	12.9
Private secondary schools				
Number of schools	1,714	1,892	1,979	2,248
Number of pupils	98,400	108,221	130,649	155,044
Number of teachers	6,231	9,775	12,073	14,026
Pupils per 1,000 population	1.6	1.4	1.4	1.5
All secondary schools				
Number of schools	4,485	8,210	12,213	13,922
Number of pupils	309,996	649,953	1,115,326	1,484,028
Number of teachers	14,501	31,553	57,240	76,545
Pupils per 1,000 population	5.0	8.5	12.3	14.4

* Compiled from *Report of the United States Commissioner of Education* (1916), vol. II, p. 449. The figures given in the Commissioner's *Reports* are to some extent faulty, especially for the earlier dates, because of incomplete returns.

secondary school within a comparatively short time. Those adjustments have by no means yet been completed. (*b*) A specific instance of the difficulties arising in this connection may be found in the difficulty of providing teachers and accommodations to meet the developed needs. (*c*) The great increase in the number of secondary-school pupils is in part the result and in part the cause of the extension of the curricula to meet the diversified needs of different groups of pupils. (*d*) It is indicative of the need for further adjustments. Pupils of types not attending the secondary school before 1890 now are enrolled in large numbers. (*e*) In 1890 more than one third of the secondary schools in the country were private schools and they enrolled nearly one third of all secondary-school pupils. In 1915 the per cent of private secondary schools had fallen to about sixteen per cent of all secondary schools and the per cent of pupils attending those schools had fallen to about ten. The increasing dominance of the public secondary school over the private school is gratifying to believers in a democratic school system.

32. The distribution of pupils by schools. In discussing problems of secondary education in terms of the public schools one is apt to err in estimating the size of the "average" secondary school. It is well to keep in mind the conditions illustrated by the data presented in the following table:

TABLE XLIX. PUBLIC SECONDARY SCHOOLS AND PUPILS IN 1914–15 *

	In cities of 8000 population or over	*In other communities*	*In all communities*
Number of schools	990	10,684	11,674
Number of pupils	662,004	666,980	1,328,984
Number of teachers	25,509	37,010	62,519
Average number teachers per school	25.8	3.5	5.4
Average number pupils per teacher	26.0	18.0	21.3
Average number of pupils per school	668.7	62.4	113.9

* Compiled from data given in *Report of the United States Commissioner of Education* (1916), vol. II, pp. 449, 456, 457.

Of all pupils in the public secondary schools of the country about one half are in schools the average enrollment of which is sixty-two pupils with three or four teachers, one for every eighteen pupils. The other half attend schools the average enrollment of which is six hundred and sixty-nine pupils with twenty-six teachers, one for every twenty-six pupils. It is obvious that the secondary education which can be provided for the first group is necessarily limited by the small number of pupils attending any single school and by the correspondingly small teaching force. This factor of size of school is of particular importance in connection with problems connected with the differentiation of curricula, vocational education, and effective supervision of teaching. One of the most important, if not the most important, problems of secondary education in this country is that of providing anything like equality of educational opportunity in the small high school.

33. **The distribution of pupils by grades.** By grades the total secondary-school population is distributed as indicated in the following table.

TABLE L. PERCENTAGES OF ALL PUPILS IN THE PUBLIC SECONDARY SCHOOLS IN THE VARIOUS GRADES *

Grades	*1907–08*	*1908–09*	*1909–10*	*1910–11*	*1911–12*	*1912–13*	*1913–14*	*1914–15*
I...	43.26	43.28	42.89	42.79	41.73	40.94	40.79	40.86
II...	27.16	26.88	27.10	26.73	27.08	26.94	26.74	26.69
III...	17.85	17.83	17.83	17.97	18.21	18.63	18.63	18.46
IV...	11.73	12.01	12.18	12.51	12.98	13.49	13.84	13.99

* Compiled from data given in *Report of the United States Commissioner of Education* (1916), vol. II, p. 448.

It should be noted that a slight but favorable change has taken place within recent years in that larger proportions of the pupils are found in the third and fourth grades. This probably means that the retention of pupils through the high-school course has improved somewhat within the past few years.

In terms of the number of pupils found in the first grade of the high school the proportions are as indicated in the following table:

TABLE LI. PERCENTAGES THE NUMBER OF PUPILS FOUND IN EACH GRADE IS OF THE FIRST-YEAR ENROLLMENT*

Grades	*1907–08*	*1908–09*	*1909–10*	*1910–11*	*1911–12*	*1912–13*	*1913–14*	*1914–15*
I...	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
II...	62.8	62.1	63.2	62.5	64.9	65.8	65.6	65.3
III...	41.3	41.2	41.6	42.0	43.6	45.5	45.6	45.2
IV...	27.1	27.8	28.4	29.2	31.1	33.0	33.9	34.2

* Compiled from the same source.

Here again the improvement in conditions after 1908 should be noted.

The relatively small numbers of pupils in the second, third, and fourth grades of the public secondary school at once attract attention and call for explanation. Three factors are involved. Larger numbers of pupils begin their secondary education each successive year both as a result of the actual increase in population and because of the increasing appeal of the secondary school. Some pupils fail of promotion, remaining to swell the size of the lower class and to decrease the size of the upper class. In the third place, pupils leave school before the secondary-school course is finished, thus decreasing the number of pupils in each successive grade. The last two factors will be considered below. The first factor of increased secondary-school population may be determined *in part*[1] by comparing the per cents that pupils in the second, third, and fourth grades were of the number of pupils respectively in the first grade one, two, and three years before, with proper correction for the differing numbers of schools reporting in the various years. This is illustrated in the following table:

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[1] Retardation being assumed fairly constant for the period considered.

TABLE LII*

	I	*II*	*III*	*IV*	*Graduated*
"Class" of 1910..	100.0%	61.1%	42.5%	28.8%	28.7%
"Class" of 1911..	100.0	65.3	42.9	32.3	31.4
"Class" of 1912..	100.0	62.2	41.4	32.8	31.4
"Class" of 1913..	100.0	67.0	46.6	35.4	34.1
"Class" of 1914..	100.0	64.7	45.5	35.6	33.2

* Compiled, with allowance for the increased number of schools reporting, from *Report of the United States Commissioner of Education* (1914), vol. II, p. 408. The table should be interpreted thus: In 1906–07 there were 288,748 pupils in the first grades of 7624 schools reporting. In 1907–08 from 8960 schools 209,265 pupils were reported to be in the second grades, an average per school of 23.4 pupils. At that rate 7624 schools would have had 178,402 pupils in the second grade in 1907–08, which is 61.1 per cent of the 288,748 pupils enrolled in the first grades of 7624 high schools.

Even were exact data available concerning the factor of increased population annually it is probable that the figures given would not be changed materially. Hence the explanation of the small proportions of pupils in the second, third, and fourth grades of the public secondary school is likely to be found in the factors of retardation and elimination.

34. **Retardation and acceleration.** Pupils are said to be retarded when they are over age for the grade in which they are enrolled. The cause may be late entry into the school or failure to be promoted at any stage of the elementary school or of the secondary school. Pupils are said to be accelerated when they are under age for the grade in which they are found. The cause may be early entry into school or rapid promotion at any stage. Whether a pupil is to be considered over age, of normal age, or under age obviously depends on the standard which is taken as the "normal age." Commonly a two-year span is taken, assuming ages 6–7 for the first grade of the elementary school, 14–15 for the first grade of the four-year high school, 15–16 for the second, 16–17 for the third, and 17–18 for the fourth.

Figures for the amount of retardation and acceleration in the public secondary schools of the country at large are lacking. However, in as much as retardation at any one point in the school system affects the work of all successive grades the data presented in the following table for schools in general (elementary and secondary) are important.

TABLE LIII. MEDIAN PERCENTAGES OF THE WHOLE NUMBER OF BOYS OR GIRLS WHO WERE OF NORMAL AGE, OVER AGE, OR UNDER AGE (1908) *

	133 cities of 25,000 population or over		*186 cities of less than 25,000 population*	
	Boys	*Girls*	*Boys*	*Girls*
Of normal age	56	60	54	58
1 year over age	20	18	20	18
2 years over age	10	9	11	8
3 years over age	5	3	4	3
4 years over age	2	1	2	1
Total over age	38	32	38	36
Total under age	4	4	4	5

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* Strayer, G. D., *Age and Grade Census of Schools and Colleges*, Bureau of Education Bulletin (1911), no. 5, p. 103. Normal age defined as 6–7 for first grade, etc. For an excellent later study see Berry, C. S., *A Study of Retardation, Acceleration, Elimination, and Repetition in Two Hundred Twenty-five Towns and Cities of Michigan.*

As indicated by the figures in this table Strayer's investigation showed clearly that between fifty-five and sixty per cent of the pupils in the public schools (elementary and secondary) are of normal age, about one third or a little over are below the grade where they might be expected to be according to their age, and less than five per cent are in classes beyond those of children of their age. The majority of those reported accelerated were so because of early entrance into school. That a considerable proportion of children retarded was so retarded because of late entry into the schools is indicated by the fact that a relatively large per cent of children of ages 6–9 do not attend school. They will enter school late and be retarded from the start.

TABLE LIV. PERCENTAGES OF CHILDREN OF CERTAIN AGE GROUPS ATTENDING SCHOOL (1910) *

1-year span		*2-year span*		*3-year span*	
Age	*Per cent*	*Age*	*Per cent*	*Age*	*Per cent*
6	52.1	6– 7	63.3	6– 8	69.6
7	75.0	7– 8	78.8	7– 9	81.2
8	82.7	8– 9	84.4	8–10	86.3
9	86.2	9–10	88.1	9–11	89.1
10	90.0	10–11	90.6	10–12	90.5
11	91.2	11–12	90.5	11–13	89.9
12	89.8	12–13	89.3	12–14	86.6
13	88.8	13–14	85.0	13–15	79.6
14	81.2	14–15	75.0	14–16	66.6
15	68.3	15–16	59.1	15–17	51.2
16	50.6	16–17	44.0	16–18	36.0
17	35.3	17–18	28.7	17–19	24.1
18	22.6	18–19	18.7		
19	14.4				

* Table compiled from the data given in *Report of the Thirteenth Census* (1910), pp. 310–11, 1128.

These figures indicate that from one quarter to one third of the children enter school later than the age of six. Too great emphasis should not be placed on the fact that only a little over one half of the six-year-old children in the country were in school at the time of the census. Many of those who were six years old at the time the census was taken (as of April 15, 1910) undoubtedly were waiting to enter school the following September. The figures for age 7, however, show that that fact does not entirely explain the discrepancy between the number of children six years old and the school enrollment for that age.

It will be seen that the factor of retardation raises many problems for secondary education as it does for education in general. Among the most important of those problems may be noted the following. (*a*) Retardation, when due to late entry into the school, increases the diversity of age in any grade, thus increasing the heterogeneity of the pupil group to be taught. When due to failure of promotion, especially failure of promotion in the secondary school, it means that in many classes pupils are found repeating work in the same groups with pupils beginning it. Special classes for repeaters are exceptional and possible in large systems only. One feature of secondary-school work helps out here, the fact that in the secondary school promotion is more commonly by subjects and a change of election is possible. The problem of the "repeater" is far different from the problem of the beginner, even when the latter is retarded. (*b*) Retardation fosters the withdrawal of pupils from the school. When due to late entry the age factor tends to lessen the amount of education which many pupils can receive, since economic factors and other factors affect the amount of time which many can devote to education, especially after the end of the compulsory age period. When retardation is due to failure of promotion there is added to other factors the discouragement attendant on failure. (*c*) Retardation means greater expense in the maintenance of the schools. Ayres[1] in a study of sixty-five cities estimated the cost of repeaters to be from 6.5 to 30.3 per cent of all money expended for schools in those cities. The cost of repeaters in the secondary school is particularly heavy, since the cost of education per pupil in the secondary school is considerably higher than in the elementary school. (*d*) Perhaps most important of all is the fact that retarded pupils, whatever be the cause of their retardation, represent a large economic and social loss.

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[1] Ayres, L. P., *Laggards in Our Schools*, pp. 96–97.

Pupils entering school late and proceeding through the school at the normal rate must enter on their life's work late with resulting loss to themselves and to society. Pupils retarded by non-promotion likewise must enter on their life's work with the same economic and social loss unless that delay is caused by native incapacity and the added time in the school increases their abilities proportionately. It must, of course, be recognized that a certain proportion of retarded pupils is to be expected and must arise out of the legitimate selective function of the secondary school and other divisions of the school system.

The comparatively small number of pupils who complete their secondary education in less than the normal time also raises some important problems. Assuming a chance distribution of abilities among secondary school children in general it is to be expected that there are almost as large proportions of relatively bright pupils as relatively dull pupils, and hence that the number of accelerates would more nearly equal the number of repeaters (though not of retarded pupils). Since a number of factors tend to lessen ability and achievement (illness, etc.) without corresponding factors which may tend to raise ability and achievement, the proportion of accelerates cannot be expected to equal the proportion of repeaters. Such factors cannot, however, explain the large discrepancy at present found. The cause is probably to be found in the inflexible machinery of administration.

As retardation represents a large positive loss so the small amount of acceleration represents a negative loss — a failure to develop large potential values. It would appear that the public secondary school is ill-adapted both to the needs of the duller pupil and to the needs of the brighter pupil. All our knowledge of individual differences justifies the belief that a larger proportion of secondary school pupils should complete their secondary education in less time than that allotted to the "average" pupil.

35. The elimination of pupils by grades. By elimination of pupils is meant their withdrawal before they have completed the school course. In any school system a certain amount of elimination is always to be expected as the result of death, transfer, economic conditions, and the progressively selective function of the educational system. Such factors cannot, however, explain the great amount of elimination commonly found in the American public schools. The amount of elimination for any particular school system is determined with relative ease, but the amount varies very greatly. For school systems in general three somewhat extensive investigations have been made. Thorndike studied conditions in 23 cities of 25,000 population or over in 1906.

TABLE LV. PERCENTAGES IN THE DIFFERENT GRADES OF THOSE BEGINNING THE FIRST GRADE OF THE ELEMENTARY SCHOOL

Grade	*Per cent remaining*				*Per cent eliminated*			
	Thorndike *	*Ayres* †	*Strayer* ‡	*Average*	*Thorndike* *	*Ayres* †	*Strayer* ‡	*Average*
1...	(100)	(100)	(100)	(100)	(0)	(0)	(0)	(0)
2...	(100)	(100)	(100)	(100)	(0)	(0)	(0)	(0)
3...	(100)	(100)	(100)	(100)	(0)	(0)	(0)	(0)
4...	90	(100)	(100)	(97)	10	(0)	(0)	(3)
5...	81	(100)	95	(93)	19	(0)	5	(7)
6...	68	90	74	77	32	10	26	23
7...	54	70	63	62	46	30	37	38
8...	40	50	51	47	60	50	49	53
I...	27	40	39	35	73	60	61	65
II...	17	20	22	20	83	80	78	80
III...	12	12	18	14	88	88	82	86
IV...	8	10	14	11	92	90	86	89

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* Thorndike, E. L., *The Elimination of Pupils from School*, Bureau of Education Bulletin (1907), no. 4, pp. 11, 47.

† Ayres, L. P., *Laggards in Our Schools*, p. 71. Estimates from graph.

‡ Strayer, G. D., *Age and Grade Census of Schools and Colleges*, Bureau of Education Bulletin (1911), no. 5, pp. 6, 135–36. The writer is responsible for the interpretation of the data there given. There is a certain amount of inconsistency between the graph and the figures given. Likewise there is inconsistency between the data given, *loc. cit.*, and that in the *Report of the United States Commissioner of Education* (1910), vol. II, p. xxiii.

Ayres studied conditions in 58 cities in 1908. Strayer studied conditions in 133 cities of 25,000 population or over and 186 cities of less than 25,000 population — in all 319 cities. The figures given in the Table LV indicate the general tendency discovered by those investigators. Those figures must not be interpreted with exactness since many factors render them at best only approximate.

These figures can be considered as approximate only since they are based on data necessarily incomplete and valid for the time of the investigation only. However, the general tendency, with some allowance for improvement since those investigations were made, would indicate that little more than one third of the pupils who enter school reach the first grade of the four-year high school and that about one tenth only complete the course.

Since the particular problem here is that of the secondary school we may interpret the figures already given in terms of those who enter the first grade of the four-year high school.

TABLE LVI. PERCENTAGES IN DIFFERENT GRADES OF THOSE WHO ENTER THE FIRST GRADE OF THE FOUR-YEAR HIGH SCHOOL *

Grade	*Per cent remaining*				*Per cent eliminated*				*Proportionate per cent eliminated between grades*			
	Thorndike	*Ayres*	*Strayer*	*Limits*	*Thorndike*	*Ayres*	*Strayer*	*Limits*	*Thorndike*	*Ayres*	*Strayer*	*Limits*
I...	100	100	100	100	0	0	0	0				
II...	63	50	56	50–63	37	50	44	37–50	37	50	44	37–50
III...	44	30	46	30–46	56	70	54	54–70	30	40	18	18–40
IV...	30	25	33	25–33	70	75	67	67–75	32	17	28	17–32

* Derived from the data given in Table LV.

On the basis of such figures and those presented in Tables L–LV it is probably safe to say that of pupils entering the four-year high school from one half to two thirds reach the second grade, from one third to one half reach the third grade, and from one quarter to one third reach the fourth grade. Of all pupils eliminated during the four-year high-school course it is probable that about one half are eliminated during or at the close of the first year.[1] There is evidence that conditions have improved within the past five years or so and that present figures are somewhat higher for retention than those indicated in the tables above for the secondary school.

Since the work of the secondary school is intimately affected by the work of the later grades of the elementary

TABLE LVII. PERCENTAGES IN DIFFERENT GRADES OF THOSE ENTERING THE SEVENTH GRADE OF THE ELEMENTARY SCHOOL*

Grade	*Per cent remaining*				*Per cent eliminated*				*Proportionate per cent eliminated between grades*			
	Thorndike	*Ayres*	*Strayer*	*Limits*	*Thorndike*	*Ayres*	*Strayer*	*Limits*	*Thorndike*	*Ayres*	*Strayer*	*Limits*
7...	100	100	100	100	0	0	0	0	22	29	19	19–29
8...	78	71	81	71–81	22	29	19	19–29	34	20	23	20–34
I...	50	57	62	50–62	50	43	38	38–50	*37*	*50*	*44*	*37–50*
II...	31	29	35	29–35	69	71	65	65–71	30	40	18	18–40
III...	22	17	29	17–29	78	83	71	71–83	32	17	28	17–32
IV...	15	14	22	14–22	85	86	78	78–86				

* Derived from the data given in Table LV.

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[1] Counts, G. S., *A Study of the Colleges and High Schools of the North Central Association.* Bureau of Education Bulletin (1915), no. 6, p. 46.

school and since a closer relation between those grades and the upper grades appears probable in the near future it is well to consider this factor in connection with elimination in grades seven and eight of the elementary school. (Table LVII.)

It is to be noted that the largest proportionate elimination is found between the first and second grades of the high school. School conditions foster a relatively high amount of elimination between the last grade of the elementary school and the first grade of the high school. Nevertheless the amount of elimination at that point is smaller proportionately than the amount between the first and second grades of the secondary school. It is not improbable that the large amount of elimination found at that point is largely due to the difficulty of transition from the elementary school to the secondary school, the inability of the pupil to readjust himself to the markedly different conditions in the high school leading to failure in work and ultimate withdrawal. A glance at such figures as are presented in Table II, will show that compulsory attendance laws affect grades 7 and 8 even more than grade I.

36. The elimination of pupils by age. Nothing is more certain than that the older the school pupil becomes the stronger is the force of those economic and social influences which ultimately will remove him from the school. Up to the age of fourteen the public schools hold their pupils well, aided by compulsory attendance laws. After that age is reached pupils leave school in great numbers. In 1910, according to the Thirteenth Census returns 90.9 per cent of all thirteen-year-old children were attending school, 85.3 per cent of the fourteen-year-olds, 75 per cent of the fifteen-year-olds, 58.9 per cent of the sixteen-year-olds, and 42.9 per cent of the seventeen-year-olds. These facts suggest one of two things: (1) that the compulsory attendance laws be raised without the privilege of employment certificates to the age

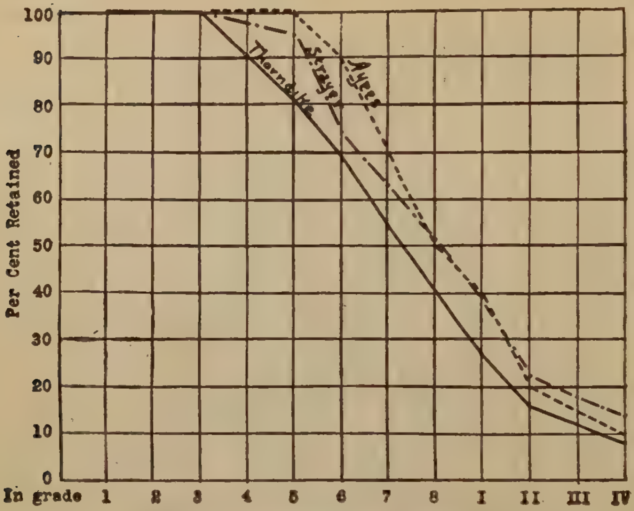

FIGURE L. ILLUSTRATING TABLE LV

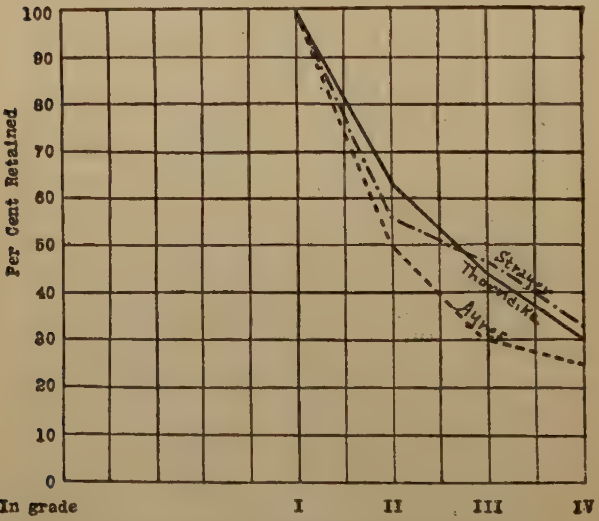

FIGURE M. ILLUSTRATING TABLE LVI

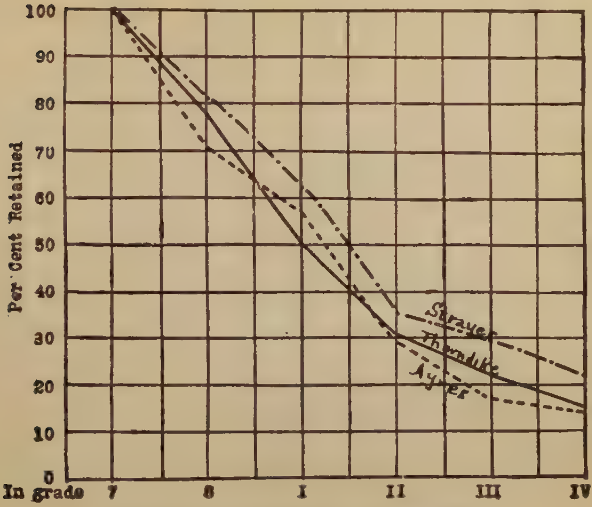

Figure N. Illustrating Table LVII

of sixteen; or (2) that opportunity to receive some of the benefits of secondary education be provided for pupils below the age of fourteen. The latter plan is a part of the scheme for the reorganization of secondary education recommended in later chapters.

When elimination by age is brought into comparison with elimination by grade in the secondary school it is found that the older pupils are on entrance to the school the earlier and more rapidly they are eliminated. This is seen from the results of studies by Van Denburg (Table LVIII) and by others. The meaning of the figures in Table LVIII is obvious.

The amount of elimination at different ages in New York City was found by Van Denburg to be as indicated in Table LIX. The figures indicate percentages of the total number eliminated.

TABLE LVIII. ELIMINATION BY AGE AND GRADE IN NEW YORK CITY HIGH SCHOOL *

Age at entrance	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
Below 13	19	31	3	6	19	22	41	59
13......	31	17	10	8	14	20	34	66
14......	36	20	13	6	15	10	25	75
15......	44	21	5	9	14	7	21	79
16......	47	30	9	4	6	4	10	90

* Compiled and arranged from data given by Van Denburg, J. K., *Causes of the Elimination of Students in Public Secondary Schools of New York City*, p. 91. In the table 13 years means 13 years, 0 months, to 13 years, 11 months, etc.

TABLE LIX †

	Per cent eliminated at the age of										*Median age on leaving*
	11	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*	
Boys..	0.4	1.1	13.6	21.3	26.9	20.3	11.2	4.5	0.7	0.0	14 years, 7.3 months
Girls..	0.0	0.5	12.0	27.4	26.4	21.4	7.8	3.8	0.5	0.2	14 " 5.4 "
Both..	0.1	0.7	12.7	24.9	26.6	21.0	9.2	4.1	0.6	0.1	14 " 6.3 "

† Van Denburg, J. K., *op. cit.*, p. 91. Per cents calculated and table arranged by the writer.

37. Elimination and home conditions. The relation between home conditions and elimination is very close in all probability. Such conditions are, of course, too complex and variable to permit anything like complete analysis. Certain features have been measured by Van Denburg, King,[1] Holley, and others. Some of their findings are suggestive here.

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[1] King, I., *The High-School Age*, pp. 154–84.

(1) *Financial conditions and elimination*: Van Denburg investigated the amount of elimination found in various groups of pupils selected and classified on the basis of family income as measured by the monthly rental paid.

TABLE LX *

Monthly rental	*Per cent eliminated during the*				*Retarded* (*per cent*)	*Graduated* (*per cent*)	*Staying 4 years* (*per cent*)	*Total eliminated* (*per cent*)
	1st year	*2d year*	*3d year*	*4th year*				
$10......	41	19	3	9	9	19	28	72
$15......	41	21	8	10	8	12	20	80
$20......	39	17	11	8	3	22	25	75
Over $20.	31	28	7	4	15	15	30	70

* Van Denburg, J. K., *op. cit.*, p. 111.

Van Denburg states: "On the whole the economic status of these pupils (so far as it is shown by the monthly rental) seems to be only a slight factor in the determination of length of stay in the high school."[1] Holley, basing his conclusions on a study of rental value of home, personal property assessment, and real assessment, for parents of high-school children in Urbana, Illinois, claims that there is a fairly high correlation between the economic status of the family and persistence in the school.[2]

(2) *Size of family:* According to Van Denburg a pupil having no younger brother or sister stands a somewhat better chance of staying in school longer. His figures, however, are by no means conclusive evidence.

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[1] Van Denburg. J. K., *op. cit.*, p. 113.

[2] Holley, C. E., "The Relationship Between Persistence in School and Home Conditions," *Fifteenth Yearbook of the National Society for the Study of Education*, part II, especially pp. 55–62.

TABLE LXI *

Having or without younger brother or sister	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
Having...	44	20	10	6	10	10	20	80
Without...	34	20	9	8	16	13	29	71

* Van Denburg, J. K., *op. cit.*, p. 93. Calculated and arranged by the writer.

(3) *Nationality of father:* Apparently little can be inferred from the data presented by Van Denburg concerning the nationality of the father.

TABLE LXII †

Nationality of father	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
American..	34	18	11	9	18	10	28	72
German...	39	24	9	4	8	16	24	76
Russian...	33	16	9	13	11	16	29	71
Irish......	58	18	11	4	8	1	9	91
All........	37	20	10	7	14	12	26	74

† Van Denburg, J. K., *op. cit.*, p. 96. Calculated and arranged by the writer.

Such data are quite inadequate as a basis for conclusions.

(4) *Occupation of father:* Holley's investigation indicates that expectancy of stay in the high school is greater for pupils whose fathers are engaged in professional and commercial occupations and less for those pupils whose fathers are engaged in artisan trades, in semi-skilled, and in unskilled occupations.[1]

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[1] Holley, C. E., *op. cit.*, pp. 19, 75–78.

(5) *Education of parents:* Holley's investigation also indicates that there is a close correlation between the amount of education received by parents and the stay of children in the high school.[1]

38. Elimination, early intention, and early promise. Many boys and girls (together with their parents) have little faith that a secondary-school course will much benefit them in the life to which they look forward. This is clearly seen from the data presented in the two tables following.

TABLE LXIII. "DO YOU REGARD A HIGH-SCHOOL COURSE AS NECESSARY FOR THE REALIZATION OF YOUR PLANS FOR THE FUTURE?" *

Answer to the question	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
"Yes":								
Boys.......	30	19	11	14	9	17	26	74
Girls.......	22	18	12	9	26	13	39	61
Both.......	26	18	12	11	18	15	33	67
"No":								
Boys.......	53	23	11	2	9	2	11	89
Girls.......	48	20	7	5	10	10	20	80
Both......	49	21	8	4	10	8	18	82
"Undecided":								
Boys......	38	29	8	5	9	11	20	80
Girls.......	42	18	11	2	17	10	27	73
Both.......	41	22	10	3	14	10	24	76

* Calculated and arranged from Van Denburg, *op. cit.*, pp. 104–05.

If, at the beginning of his high-school course, a boy expects to complete the course, on the basis of Van Denburg's finding for New York City, the chances are approximately even that he will be eliminated in the first year, in the second

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[1] Holley, C. E., *op. cit.*, pp. 28–32, 39–53.

TABLE LXIV. "DO YOU EXPECT TO COMPLETE YOUR COURSE?" *

Answer to the question	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
"Yes":								
Boys	25	20	12	13	14	16	30	70
Girls	18	17	12	7	28	18	46	54
Both	21	18	12	10	22	17	39	61
"No"								
Boys	72	16	6	2	2	2	4	96
Girls	71	15	3	2	5	4	9	91
Both	72	15	4	2	3	3	6	94
"Undecided":								
Boys	49	26	9	3	4	9	13	87
Girls	44	25	11	6	8	5	13	87
Both	46	25	10	5	7	7	14	86

* Calculated and arranged from Van Denburg, *op. cit.*, p. 108.

year, or that he will remain four years. If, on the other hand, he does not expect to complete the course, the chances are nearly three to one that he will leave school during the first year, are nearly nine to one that he will leave during the first or second year, and are only one in twenty-five that he will stay four years. If he is undecided whether he will remain four years or not the chances are even that he will leave during the first year, are three to one that he will leave during the first or second year, and are about one in eight that he will remain four years.

Early promise as indicated by records made during the first half year of school work affords a fairly good measure of the length of time pupils will remain in the secondary school. This has been measured by Van Denburg with the results indicated in the following table.

TABLE LXV*

Average mark 1st half year	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total eliminated (per cent)*
	1st year	*2d year*	*3d year*	*4th year*				
90–100...	6	12	12	6	11	53	64	36
80– 89...	17	20	2	10	14	37	51	49
70– 79...	20	23	11	10	18	18	36	64
60– 69...	39	20	14	6	18	3	21	79
51– 59...	48	18	11	7	11	5	16	84
0– 49...	61	22	8	4	5	0	5	95

* Calculated and arranged from Van Denburg, J. K., *op. cit.*, p. 175.

Much the same situation is found when "early promise" is measured by the teachers' estimates of pupils' ability, industry, and results. Van Denburg found the following figures.

TABLE LXVI†

Division of class group	*Per cent eliminated during the*				*Retarded (per cent)*	*Graduated (per cent)*	*Staying 4 years (per cent)*	*Total elimination (per cent)*
	1st yr.	*2d yr.*	*3d yr.*	*4th yr.*				
Estimated ability:								
Highest third...	22	18	9	6	15	30	45	55
Middle third....	39	20	11	8	14	8	22	78
Lowest third....	48	18	10	4	16	4	20	80
Estimated industry:								
Highest third...	27	19	7	6	17	24	41	59
Middle third....	37	18	12	8	15	10	25	75
Lowest third....	49	19	11	4	13	4	17	83
Estimated results:..								
Highest third...	21	16	11	7	17	28	45	55
Middle third....	34	22	9	8	18	9	27	73
Lowest third....	49	17	12	6	13	3	16	84

† Calculated and arranged from Van Denburg, J. K., *op. cit.*, p. 149.

Dynes secured data concerning the grades received by graduates and non-graduates which indicate much the same condition as that shown by the preceding tables.

TABLE LXVII. GRADES RECEIVED BY PUPILS*

Grades	*Graduates*		*Non-graduates*		*Total per cent*	
	Number	*Per cent*	*Number*	*Per cent*	*Graduates*	*Non-graduates*
Excellent....	2121	85	370	15	12	6
Good.......	8464	81	1961	19	49	31
Medium.....	4540	72	1726	28	26	27
Poor.........	1272	64	720	36	7	11
Failure......	1037	40	1564	60	6	25

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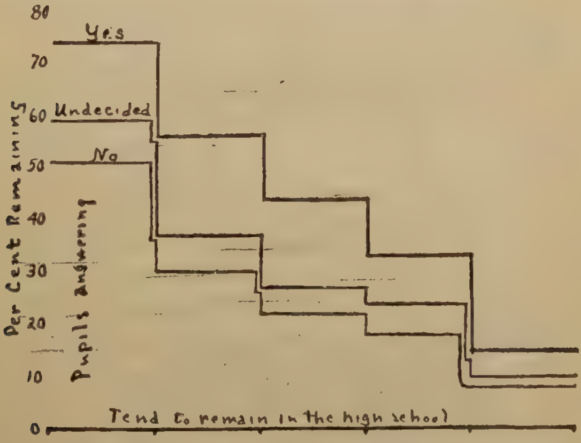
* Dynes, J. J., "The Relation of Retardation to Elimination of Students from the High School," *School Review*, vol. XXII, p. 404.

39. The lure of the out-of-school world. Closely related to the factors considered above is a large number of factors which seriously affect the stay of pupils in school. In the upper grades of the system the school must constantly wage an uphill fight against the increasing power of the "outside" world to draw boys and girls out of the school into occupational life. One of the most powerful factors producing early elimination in the school arises from the world-old unwillingness of the individual to forego a present lesser good for the sake of a later greater good. The error is frequently made of assuming that it is primarily the desire to engage in active life which draws boys and girls out of school. That element is undoubtedly present in many cases. The real element involved in most cases, however, is not work but the advantages which come from engaging in an occupation and becoming a wage earner — the securing and spending of money and the increased freedom and privileges which come when the boy or girl becomes a somewhat financially independent individual. The boy or girl in school sees his former school fellow able to enjoy many privileges and to attain a degree of independence not granted to himself. The stimulus to go and do likewise is in many, many cases irresistible.

When the influence of the world without the school is rapidly growing, the character of the education provided in the school (especially in grades seven and eight) does not afford a very strong counteracting influence. The theory may, perhaps, be justified that the character of much of the work of the middle grades of the school system itself in many cases becomes a very effective eliminating factor.

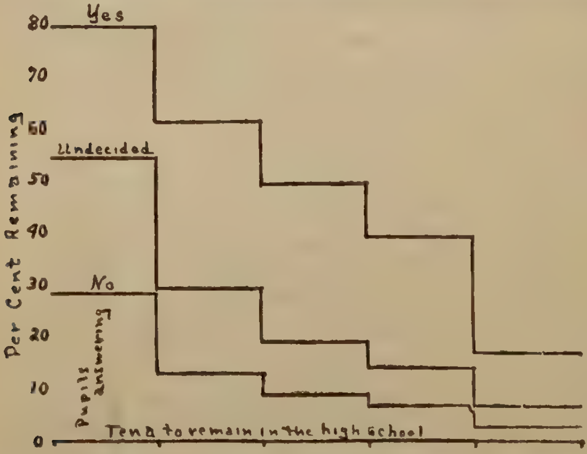


	1st year	*2d year*	*3d year*	*4th year*	*Graduated*
Yes	74%	56%	44%	33%	15%
Undecided	59	37	27	24	10
No	51	30	22	18	8

FIGURE O. ILLUSTRATING THE EXPECTANCY OF STAY IN THE HIGH SCHOOL

Measured by answers to the question: "Do you regard a high-school course as necessary for the realization of your plans for the future?" Read as follows: Of those pupils who answered "Yes" to this question 74 per cent remained through the first year, 56 per cent through the second year, 44 per cent through the third year, 33 per cent through the fourth year, and 15 per cent were graduated. (Cf. Table LXIII and Van Denburg, *op. cit.*, pp. 104–05.)

40. Expectancy of stay in the secondary school. The length of time different groups of pupils can be expected to remain in the public high school may be estimated to a certain degree by the figures for elimination which have been presented in the preceding tables. On the basis of similar figures procured for any individual secondary school it is possible to undertake some diagnosis of the probable conditions to be found in that school one, two, or three years later.[1] This is clearly true with respect to groups of pupils.



	1st year	2d year	3d year	4th year	Graduated
Yes	79%	61%	49%	39%	17%
Undecided	54	29	19	14	7
No	28	13	9	7	3

FIGURE P. ILLUSTRATING THE EXPECTANCY OF STAY IN THE HIGH SCHOOL

Measured by answers to the question: "Do you expect to complete the high-school course?" Read as follows: Of those pupils who answered "Yes" to this question 79 per cent remained through the first year, 61 per cent through the second year, 49 per cent through the third year, 39 per cent through the fourth year, and 17 per cent were graduated. (Cf. Table LXIV and Van Denburg, *op. cit.*, p. 108.)

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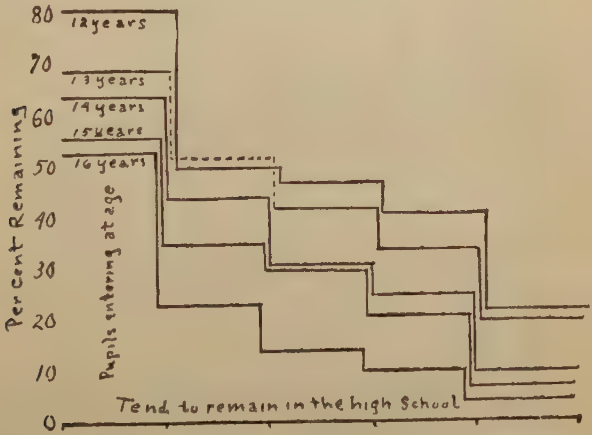
[1] Cf. Thorndike, E. L., "Educational Diagnosis," *Science*, vol. XXXVII, pp. 133–42, 258: Strayer, G. D., and Thorndike, E. L., *Educational Administration*, pp. 46–53.

It is also to some extent true of the diagnosis of individual school careers. The fact that a boy or girl belongs to any one group whose school course may be prophesied with considerable confidence does not, of course, necessarily imply that the school history of that individual boy or girl will be that of the group. When, however, an individual boy or girl is found to belong to a number of groups all of which indicate the same general expectancy, the chances must be considered great that his probable stay in the school will be thereby approximately determined.

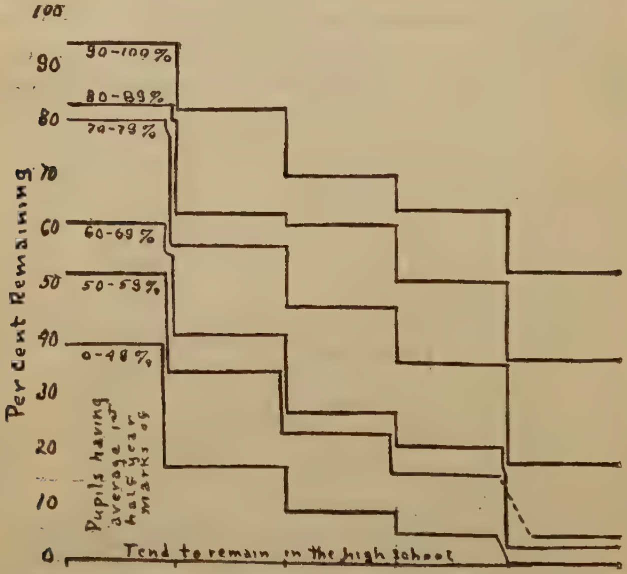


	1st year	*2d year*	*3d year*	*4th year*	*Graduated*
Under 13 years	81%	50%	47%	41%	22%
13 years	69	52	42	34	20
14 years	64	44	31	25	10
15 years	56	35	30	21	7
16 years	53	23	14	10	4

FIGURE Q. ILLUSTRATING THE EXPECTANCY OF STAY IN THE HIGH SCHOOL

Measured by the age of entrance into the high school. Read as follows: Of pupils under 13 years of age at entrance 81 per cent remained through the first year, 50 per cent through the second year, 47 per cent through the third year, 41 per cent through the fourth year, and 22 per cent were graduated. (Cf. Table LVII and Van Denburg, J. K., *op. cit.*, p. 91.)

In Figures O to S are indicated the expectancies of stay as determined in New York City schools as derived from data secured by Van Denburg.[1] Such figures and graphs suggest a valuable method of diagnosing the probable school careers of groups of pupils and to a less extent of individual pupils.



	1st year	2d year	3d year	4th year	Graduated
90–100%	94%	82%	70%	64%	53%
80– 89	83	63	61	51	37
70– 79	80	57	46	36	18
60– 69	61	41	27	21	3
50– 59	52	34	23	16	5
0– 49	39	17	9	5	0

FIGURE R. ILLUSTRATING THE EXPECTANCY OF STAY IN THE HIGH SCHOOL

Measured by grades received during the first half-year. Read as follows: Of pupils receiving an average grade of 90–100 per cent during the first half-year, 94 per cent remained through the first year, 82 per cent through the second year, 70 per cent through the third year, 64 per cent through the fourth year, and 53 per cent were graduated. (Cf. Table LXV and Van Denburg, J. K., *op. cit.*, p. 175.)

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[1] The writer is responsible for the graphs.

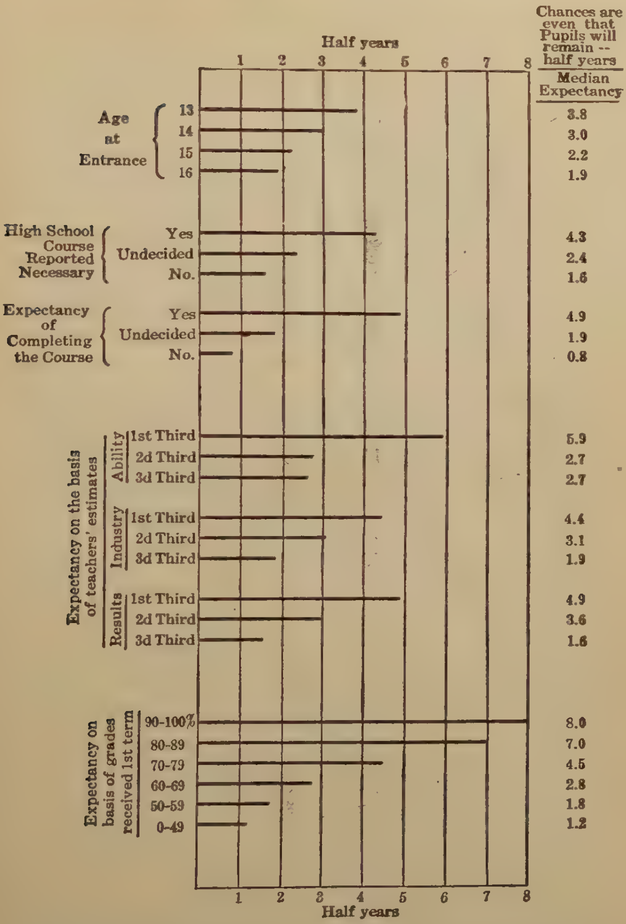

FIGURE S. ILLUSTRATING MEDIAN EXPECTANCY OF STAY IN THE HIGH SCHOOL

Measured by various factors. Each vertical line represents the end of one half-year term. Read as follows: Of pupils who entered high school at the age of 13, one half remained less than 3.8 half-years and one half remained more than 3.8 half-years. The chances are therefore one to one that any pupil entering at that age would remain 3.8 half years. (Cf. Tables LVII, LXIII, LXIV LXV, LXVI.)

II. THE CLASSIFICATION OF PUPILS

41. The classification of secondary-school pupils. For purposes of organization and administration pupils in the public secondary schools are best classified on the basis of their expectancy of stay in the school and their probable future activities after leaving. Two general groups for initial consideration are (i) those who are destined to complete the course, and (ii) those who are destined to leave the secondary school before the completion of the course. Those who are destined to complete the course may further be divided into (1) those whose education is to continue beyond the secondary school, consisting of (*a*) those who will go to college, and (*b*) those who will attend some other institution of higher education; and (2) those whose formal education is to end at the close of the secondary-school course. Those who will not complete the secondary-school course may be divided into groups of (1) those who will remain not more than one year, (2) those who will remain one year but not more than two years, and (3) those who will remain two years but not more than three years. It is obvious that the needs of these various groups differ noticeably and that their different needs call for forms of education differing in some respects. The composition of the several groups and their proportionate importance are considered in the following sections.

42. Pupils completing the course. The secondary school was largely a school preparing its pupils for higher education until toward the close of the nineteenth century. During the last decade of the nineteenth century and the beginning of the present century there has been a marked increase in the attendance in the public secondary school of pupils who were not destined for higher education. As a result there has been a distinct decrease in the *proportion* of secondary-school pupils destined for higher education, although the gross *number* has increased absolutely and in relation to growth in population. Realization of that fact has led to an underestimate by many of the proportion of pupils going to college or other institutions of higher education from the public secondary schools. Thus, in 1893 the Committee of Ten stated that "only an insignificant percentage of the graduates of these [high] schools go to colleges or scientific schools," and that statement has been accepted generally since that time. It is, however, quite false. In 1915, of the graduates of the public high schools of the country, 35.85 per cent were prepared for college and 16.27 per cent were prepared for other higher institutions, making a total of approximately one half of the graduates of our public high schools prepared for higher education in that year.[1] For several years the proportion has been approximately the same.

If we assume that approximately one third of pupils entering the first grade of the high school are graduated, the figures above given would indicate that about one sixth of the pupils who enter the secondary school are destined to enter some higher institution and that about one sixth are destined to close their education at the end of the secondary-school course. Since about one third of the graduates of the public secondary schools go to college, approximately one ninth of those who enter the secondary school must be destined to go to college. On the same basis approximately one eighteenth of those who enter the secondary school must be considered as destined to enter some higher institution other than the college — for the most part the normal schools.

Since about two thirds of those who enter the first grade of the four-year high school reach the second grade, and since about one third of those who enter the first grade of the high school are destined to graduate, it follows that about one half of all pupils in the second grade of the high school are destined to graduate. From these figures we find that of all pupils in the second grade of the high school approximately one quarter will enter higher institutions, about one sixth entering college and about one twelfth going to other institutions. By a similar line of reasoning we may estimate figures for the third grade of the high school. Figures for the fourth grade for all practical purposes may be assumed to

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[1] *Report of the United States Commissioner of Education* (1916), vol. II, pp. 454–55.

TABLE LXVIII. PERCENTAGES OF DIFFERENT GROUPS OF PUPILS IN THE VARIOUS GRADES OF THE PUBLIC HIGH SCHOOL *

Groups	*Grades*			
	I	*II*	*III*	*IV*
I. Destined to be graduated	33.3	50.0	66.6	100.0
1. Going to higher institutions	16.6	25.0	33.3	50.0
a. Going to college	11.1	16.6	22.2	33.3
b. Going to other higher institutions	5.5	8.4	11.1	16.7
2. Graduating but not continuing education	16.7	25.0	33.3	50.0
II. Pupils destined not to be graduated	66.6	50.0	33.4	...
1. Staying one year or less	33.3	...	...	...
2. Staying more than 1 year, not more than two	20.0	35.0	...	...
3. Staying more than 2 years, not more than three	10.0	14.0	33.4	...

* The reader is warned against interpreting the figures as anything more than a reasonable estimate true for the whole country. Conditions in any particular community may differ widely from that indicated by the figures given. An actual study of the figures presented in the report of the United States Commissioner of Education for the period 1909–13 gave the following figures:

Groups	*Grades*			
	I	*II*	*III*	*IV*
I. Pupils graduated	34.2	51.1	73.4	96.7
1. Going to higher institutions	17.5	26.1	37.7	49.5
a. Going to college 1913	12.0	17.9	25.7	33.9
b. Going to other higher institutions	5.5	8.2	11.8	15.6
2. Graduating but going no further	16.7	24.9	35.8	47.2
II. Pupils not graduating	65.8	48.9	26.6	3.3

approximate those for graduates. Summarizing we may suggest Table LXVIII as indicating the approximate proportions of pupil-groups in the different grades of the four-year public high school for the country at present.

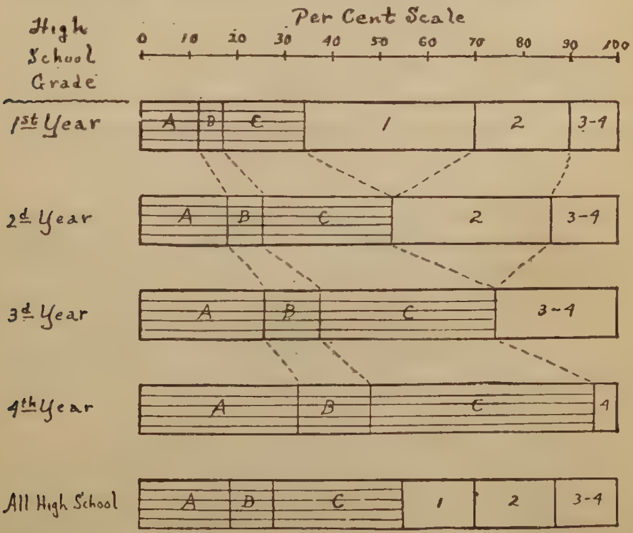

FIGURE T. ILLUSTRATING THE PROPORTION EACH GROUP IS OF THE TOTAL NUMBER IN THE HIGH-SCHOOL CLASSES — 1913–14

Shaded portion for those completing the course:
A. Going to college.
B. Going to some higher institution.
C. Closing their education at the end of the high school.
Unshaded portion for those not completing the course:
1. Those staying one year or less.
2. Those staying more than one year, not more than two years.
3. Those staying more than two years, not more than three years.
4. Those staying more than three years, but not staying four.

It is probable that the large proportion of pupils preparing for admission to higher education in many high schools is indicative of the fact that that function of secondary education is receiving too great attention and that insufficient attention is being paid to groups of pupils who are destined to leave school early or to end their formal education with the close of the secondary-school course. This fact is clearly shown by the fact that in those States where the percentage of high-school graduates going to higher institutions is unusually large the per cent which the graduates are of all pupils in the high schools is relatively small, the number of high-school pupils in each million of total population is relatively small, and the number of graduates to each million of total population is relatively small. This is shown in the following table.

TABLE LXIX. STATES ARRANGED IN THE ORDER OF THE LOWEST TO THE HIGHEST PERCENTAGES OF GRADUATES OF THE HIGH SCHOOLS GOING TO COLLEGE IN 1911*

	Lowest quarter	*Second quarter*	*Third quarter*	*Highest quarter*	*Lower half*	*Higher half*
Median per cent of graduates going to college.	26.00	35.00	42.00	53.00	31.00	47.00
Per cent graduates were of all pupils in the high schools.	13.94	11.99	11.18	10.01	12.79	10.74
High school pupils to each million of total population.	11,548	12,873	9,408	5,977	12,291	7,737
Graduates to each million of total population.	1,609	1,543	1,052	598	1,572	830

* Compiled from data given on pages 18–19 of Bulletin (1912) no. 22, of the Bureau of Education and the Report of the Thirteenth Census (1910). Cf. Inglis, A. J., "High School Graduates and Preparation for Higher Institutions," *School and Society*, vol. I, no. 26 (June 26, 1915), p. 933.

43. The distribution of secondary-school graduates. At least two studies have been made of the distribution of high-school graduates which are suggestive for our present purpose. The results of those studies are presented in the two tables following.

Table LXX. Distribution of 20,389 Graduates from 596 High Schools in Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, Ohio, Oklahoma, Wisconsin, 1913 *

Occupations	*In cities of less than 7500 population*		*In cities of more than 7500 population*		*In all cities considered*	
	Number	*Per cent*	*Number*	*Per cent*	*Number*	*Per cent*
College	2,636	23.75	2,854	30.72	5,490	26.9
Commercial school	437	3.94	325	3.49	762	3.7
Trades	310	2.79	381	4.10	691	3.4
Farming	462	4.16	138	1.49	600	2.9
Normal school	743	6.69	741	7.98	1,484	7.3
Business	970	8.74	1,087	11.70	2,057	10.1
At home	1,775	15.99	1,316	14.17	3,091	15.1
Professions	331	2.99	342	3.68	673	3.3
Domestic Economy, Agriculture	332	2.99	143	1.54	475	2.4
Teaching	689	6.21	182	1.96	871	4.3
Other occupations	1,832	16.50	1,076	11.59	2,908	14.3
Unknown	583	5.25	704	7.58	1,287	6.3
Total	11,000	100.00	9,289	100.00	20,389	100.0

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* Arranged from data given by Counts, G. S., *A Study of the Colleges and High Schools in the North Central Association*, Bulletin (1915) no. 6 of the Bureau of Education, p. 91.

Of the graduates going to college from 239 out of 333 school reporting, fifty or more per cent were from the highest third of the graduating classes.

Noteworthy are the different proportions of those of the highest standing for the several groups. (Table LXXII.)

Apparently those who went to college and those who stayed at home after graduation came from the most scholarly portion of the class in relatively large proportion. Apparently those who went to normal school or directly into teaching came from the average or below average group of pupils. Apparently also those who went directly into

TABLE LXXI. THE DISTRIBUTION OF HIGH-SCHOOL GRADUATES BY DESTINATION AND HIGH-SCHOOL STANDING NEW YORK STATE, 1908 *

High-school standing average	*Total cases*	*Went to college*	*Went to normal school*	*Went to professional school*	*Went directly into teaching*	*Went into business*	*Went into trade*	*Stayed at home*
67	1					1		
68	3	1			1	0	1	
69	1	0		1	0	0	0	
70	10	3	2	0	1	1	3	
71	5	2	1	0	0	1	1	
72	13	2	3	2	1	1	1	1
73	15	4	1	4	3	0	2	0
74	26	5	5	2	4	5	2	2
75	25	7	4	1	6	5	2	0
76	40	2	16	4	7	4	4	2
77	45	19	4	3	10	5	3	1
78	49	10	9	2	9	8	7	1
79	55	15	9	5	6	10	6	1
80	48	18	9	4	5	3	4	3
81	49	20	6	2	3	8	7	2
82	64	18	13	2	10	7	5	7
83	62	26	5	5	8	6	5	4
84	54	15	13	0	6	8	4	6
85	39	16	5	1	11	2	1	2
86	34	11	5	1	10	4	0	2
87	29	14	7	0	5	1	1	1
88	24	11	3	0	5	1	0	4
89	26	14	2	0	4	2	1	2
90	6	3		0	2	1	0	0
91	3	2		0		0	1	0
92	4	4		0		0		0
93	4	1		1		1		1
94	1	1				0		
95	1	1				0		
96	1	0				1		
97	1	1						
Totals	738	246	122	40	117	86	61	42
Per cent	100.00	33.61	16.60	5.43	15.63	11.70	8.30	5.58
Median rank	81.3	82.8	81.7	78.5	81.7	80.6	79.5	82.3

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* Table arranged from data given by Shallies, G. W., "The Distribution of High-School Graduates after leaving School," *School Review*, vol. XXI, no. 2 (February, 1913), pp. 86–87. Some slight errors of computation in Shallies's tables are corrected here. Apparently about twenty-four graduates are unaccounted for in his figures.

professional school, into business, and into trade came from the poorer group in relatively large proportion. This is shown even more clearly perhaps from the figures given in Table LXXIII.

TABLE LXXII. PERCENTAGE OF GRADUATES OF DIFFERENT GRADES OF SCHOLARSHIP ENTERING VARIOUS OCCUPATIONS, NEW YORK STATE *

Scholarship group	*Total number in each group*	*Went to college*	*Went to normal school*	*Went to professional school*	*Went directly into teaching*	*Went into business*	*Went into trade*	*Stayed at home*
84–97	227	41.41	13.42	1.32	18.94	9.25	3.52	7.93
79–85	278	34.89	15.11	6.50	11.51	12.23	9.71	6.12
67–78	233	23.61	19.31	8.15	18.03	13.30	11.16	3.00
67–97	738	33.61	16.60	5.43	15.63	11.70	8.30	5.58

* Tables derived from data given by Shallies, G. W., *loc. cit.*

TABLE LXXIII. PERCENTAGE OF GRADUATES ENTERING VARIOUS OCCUPATIONS FROM DIFFERENT SCHOLARSHIP GROUPS, NEW YORK STATE †

Scholarship group	*Total number in each group*	*Went to college*	*Went to normal school*	*Went to professional school*	*Went directly into teaching*	*Went into business*	*Went into trade*	*Stayed at home*
84–97	227	38.21	28.69	7.50	36.75	24.42	13.12	42.86
79–83	278	39.43	34.42	45.00	27.35	39.54	44.26	40.48
67–78	233	22.36	36.89	47.50	35.90	36.04	42.62	16.66
84–97	738	100.00	100.00	100.00	100.00	100.00	100.00	100.00

† Tables derived from data given by Shallies, G. W., *loc. cit.*

44. Pupils destined not to complete the course. Approximately two thirds of the pupils who enter the first grade of the public secondary school leave school before the close of the course. About one third of those who enter leave during the first year or before the beginning of the second year, about one half leave before the beginning of the third year and about two thirds leave before the beginning of the last year. Relatively few pupils leave school during the fourth year of the course.

If these figures be correct it follows that of all pupils leaving the secondary school before the completion of the full course three important groups demand attention in the organization and administration of the public high school.

(1) Pupils destined to receive not more than one year of secondary education constitute about one third of all pupils entering the public secondary school at the present time. In 1913–14 there were 497,110 pupils in the first grades of public high schools, about 165,703 of whom were destined to end their education at or before the end of the first grade of the secondary school. This fact demands that the attention of school authorities be directed along two lines. It demands first of all that steps be taken to decrease the number of those who leave school so early by (*a*) encouraging some to proceed further along courses now offered, or (*b*) by providing new forms of education which will encourage many who now drop out to continue further. It demands, secondly, that, for those who must drop out of school by the close of the first grade of the high school, secondary education must be provided such that they may be most benefited by their brief stay in the secondary school and best fitted for the lives which they must needs live. It is obvious that those who must leave school thus early are destined to enter industrial, commercial, agricultural, or household occupations for the most part and to live corresponding lives.

(2) Pupils destined to remain more than one year but not more than two years in the secondary school constitute about one fifth of all pupils entering the first grade and about one third of all pupils in the second grade of the high school. In 1913–14 those proportions included about 100,000 pupils in each of the first and second grades belonging to this group. Here again the facts demand that school authorities direct their attention to this group as well as to the grou

of pupils who would receive but one year of high-school education. While the lives of pupils belonging to this group may reach a somewhat higher level than the lives of those who receive but one year of high-school education, these pupils will be much of the same type and the education afforded them should differ from the latter more in extent than in general character. Such pupils are also destined to enter the industries, business, agriculture, and home-making for the most part.

(3) Pupils destined to remain more than two years but not more than three years in the secondary school constitute approximately ten per cent of the pupils entering the first grade, approximately fifteen per cent of those in the second grade, and approximately one third of those in the third grade of the secondary school. In 1913–14 those proportions included approximately 50,000 pupils in each of the first, second, and third grades of the high school. Beyond doubt many of those pupils could readily be encouraged to complete the full four years of high-school work. Others, however, must be provided for much as in the case of the other two groups considered.

No form of organization and administration of the public secondary school can be considered satisfactory which does not have as one important aim provision for these three groups of pupils so as to provide (*a*) that larger proportions of pupils may be encouraged to extend the time spent by them in the high school, and (*b*) provide suitable forms of education for those who must conclude their formal education after one, two, or three years of high-school education.

PROBLEMS FOR FURTHER CONSIDERATION

1. Show how the rapid increase of the secondary school population has affected the economy of the high school. Illustrate specific failures to adjust the secondary school to the changed conditions caused by the increase in number of pupils and changes in their character.

2. Indicate specific ways in which the secondary school of fifty pupils with two or three teachers is limited in the facilities which it can provide the pupils. Do the same for the secondary school of one hundred pupils with four or five teachers.
3. Compare the average number of pupils per public high school in the United States for the individual years from 1907–08 to 1914–15. Do the same for the average number of each of the four grades. (Cf. *Report of the United States Commissioner of Education* (1916), vol. II, p. 448.
4. What was the number of children of different school ages in 1910? Is it true that there are larger numbers of children of a given age each successive year? (Cf. the *Report of the Thirteenth Census* (1910), vol. I, p. 310.)
5. Compare the tables of the age-grade distribution for the high schools of any two or three cities. Assuming a two-year span for normal age for each grade, e.g., 14–15 for the first grade of the high school, what are the relative amounts of retardation and acceleration?
6. What common forms of administrative machinery interfere with rapid promotion in the public high school?
7. If possible secure data concerning the number of 'repeaters' in any high school and determine the cost of those repeaters, assuming that each costs the amount of the *per capita* cost of the secondary school. The actual cost would really be much less. Why? Estimate the saving in the case of accelerates on the same basis.
8. Assuming that the largest age group indicates the number of pupils beginning school each year estimate the elimination for grades of the elementary and secondary school I–IV for any school system whose age-grade distribution is available.
9. What may be the causes of the apparently great elimination between grades I and II of the public secondary school. Suggest remedies.
10. For pupils at present in the last grade of the high school secure the earliest gradings received in their first year of high-school work. Make a table indicating the per cent of elimination for groups arranged according to the different gradings received in those first reports.
11. For any high school consider the pupils belonging to the class which has recently graduated. From their school records classify them according to the scheme employed in Table LXVIII. (Compare the tables.)

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PART II

THE INSTITUTION AND ITS PURPOSE

CHAPTER V

THE DEVELOPMENT OF SECONDARY EDUCATION IN AMERICA

45. **Three principal periods of development.** The history of secondary education in America is commonly and conveniently considered according to the three principal phases of its development: (1) the Latin grammar school, covering approximately the colonial period; (2) the academy movement, beginning in the latter half of the eighteenth century and extending well into the latter half of the nineteenth century; (3) the public high-school movement, beginning in the third decade of the nineteenth century, establishing itself in the last quarter of that century, and continuing up to the present time. These three movements overlap to a considerable degree, some Latin grammar schools persisting long after the academy movement was well under way, and the academy continuing up to the present to some extent.

The distinction of periods and movements is not based on institutional changes alone. The institutional changes themselves were the outcomes of real social factors at work in American society and consequent modifications in the conceptions of the function of secondary education. When the Latin grammar schools of the American colonies became inadequate for the social needs which developed in the new country they disappeared and the academy which supplied education suited to those needs took its place as the dominant institution for secondary education. The academy, however well suited though it may have been to the frontier conditions of the early democracy and to the *laissez-faire* policy of our early government, was not well suited to our later democratic ideals or to later governmental policy. It therefore gave way to the public high school.

I. The Latin Grammar School

46. The Latin grammar school of England. The earliest secondary schools of this country were modeled on the Latin grammar schools of England. Unfortunately data regarding the early Latin grammar school of the American colonies are so meagre and fragmentary that any exact analysis of the school is impossible. Such data as we have, however, show clearly the debt of the Latin grammar school in this country to its prototype in England. In both countries the aim of the grammar school was preparation for the university. The curriculum in both cases was restricted to the study of the classics. The specific authors read, the specific books employed, and the methods of teaching involved in both countries were almost exactly the same. In both cases the schools were for those few boys who were destined to go to college or at least belonged to the upper classes.

47. The beginning of secondary education in America. As early as 1621 a movement was inaugurated to establish a grammar school at Charles City by the Virginia Company of London. Definite plans were made for its establishment, but the Indian massacres of 1622 and the downfall of the Virginia Company in 1624 ended the movement and there is no evidence that the school was ever opened. Again in Virginia a second movement to establish a grammar school was begun in 1635 when a certain Syms left his estate for the foundation of a free school. Acceptance of that grant was not confirmed until seven years later. Subsequently records refer to that school endowed by Syms as in active operation and an existing institution claims that some of the original grant remains as a part of its permanent funds.

48. The Public Latin School in Boston. The first secondary school in America, of which we have definite knowledge, was the Public Latin School founded in Boston in 1635. It is a fact of no little interest that the colonists from the beginning devoted special attention to secondary education and it is possible that secondary education as a public responsibility would not so easily have gained its way in America if impetus had not been given to that movement in early colonial days.

While the Latin grammar school in Boston probably represented secondary education at its best in colonial America and therefore cannot be considered in all respects as typical of the colonial grammar school, it is not unfair to consider it as representing at least the general scope and economy of such institutions.

(*a*) *Control and support:* In contrast with the grammar schools of England, which for the most part were controlled and supported by the Church, by guilds, or by private endowment, the Boston Public Latin School was established by the town. Since fees were regularly charged, the school cannot be said to have been free and public in the present-day sense. It was, nevertheless, a "town school" and in most respects justified its name "public." In the case of some other grammar schools bequests were frequently made to provide for their support, notably in the case of the grammar schools endowed by Edward Hopkins in Hartford, New Haven, and Hadley. In many schools endowments were of such a character that, while the schools remained "public" schools in some respects, the immediate control was placed in the hands of trustees.

(*b*) *Aim:* The definite aim of the Boston Public Latin School was to prepare boys for college (Harvard College was founded in 1636). This was the general aim of the Latin grammar schools of England and was the general aim of those schools in America. It was explicitly so stated for the grammar schools of the Massachusetts Bay Colony by the law of 1647.

(*c*) *Curriculum :* The curriculum of the Latin School, until a very late period (beginning of the nineteenth century), was almost exclusively classical and consisted in most cases solely of the study of Latin and Greek. One of the earliest known complete programs of the Boston Latin School was that adopted in 1789. Excerpts pertinent to the present consideration follow, that as complete a view as possible may be given in brief space.

> The System of Public Education, adopted by the Town of Boston, 15th Octob. 1789. I. That there shall be one school in which the rudiments of the Latin and Greek languages shall be taught, and scholars fully qualified for the Universities. That all candidates for admission into this School shall be at least ten years of age, having previously been well instructed in English Grammar; that they shall continue in it not longer than four years, and that they have liberty to attend the public writing Schools at such hours as the visiting Committee shall direct.
>
> [II–IV deal with lower schools only.]
>
> Votes of the Committee appointed to carry into Execution the System of public Education adopted by the Town of Boston, 15th October 1789,
>
> At a meeting of the said Committee, held Decemb. 1, 1789.
>
> VOTED, I. That the Latin Grammar school be divided into four Classes, and that the following Books be used in the respective Classes.
>
> 1st Class — Cheever's Accidence. Corderius's Colloquies — Latin and English. Nomenclator, Æsop's Fables — Latin and English. Ward's Latin Grammar, or Eutropius.
>
> 2d Class — Clarke's Introduction — Latin and English. Ward's Latin Grammar. Eutropius, continued. Selectæ e Veteri Testamento Historiæ, or, Castilio's Dialogues. The making of Latin, from Garretson's Exercises.
>
> 3d Class — Cæsar's Commentaries. Tully's Epistles, or Offices. Ovid's Metamorphoses. Virgil. Greek Grammar. The making of Latin from King's History of the Heathen Gods.

4th Class — Virgil, continued. — Tully's Orations. Greek Testament. — Horace. Homer. — Gradus ad Parnassum. The making of Latin continued.

[Sections II–IV deal with the lower schools only.]

V. That the following hours be punctually observed in all the Schools, viz. From the third Monday in April to the third Monday in October, the Schools begin at half past 7 o'Clock, A.M. and continue 'till eleven, and begin at half past 1 o'Clock, P.M. and continue 'till five. — That from the third Monday in October to the third Monday in April, the Schools begin at half past 8 o'Clock, A.M. and continue 'till eleven, and begin at half past 1 o'clock, P.M. and continue 'till half past four.[1]

No change was made from the purely classical course of the Boston Public Latin School until some time between 1814 and 1828 (during the headmastership of Gould), when arithmetic, geometry, trigonometry, algebra, and geography were introduced. By 1826 declamation, reading, English grammar, English composition, forensic discussions, history and chronology, the constitution of the United States and of Massachusetts were introduced. In the case of some Latin grammar schools such modifications in the curriculum were introduced earlier.

49. The Massachusetts Bay Colony law of 1647. While Harvard College had been established by the General Court in 1636 and legislation touching on education had occurred in 1641, 1642, and 1645, the earliest legislation in this country which affected secondary education in any comprehensive way was the law passed in 1647 by the Massachusetts Bay Colony. This law (with spelling modernized) was as follows:

It being one chief project of that old deluder Satan to keep men from the knowledge of the Scriptures, as in former times by keep-

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[1] The System of Public Education, adopted by the Town of Boston, 15th Octob. 1789. Quoted by Jenks, Henry F., *Catalogue of the Boston Public Latin School*, pp. 286–88.

> ing them in an unknown tongue, so in these latter times by persuading from the use of tongues, that so at least the true sense and meaning of the original might be clouded by false glosses of saint-seeming deceivers, that learning may not be buried in the grave of our fathers in the church and commonwealth, the Lord assisting our endeavors, —
>
> It is therefore ordered, that every township in this jurisdiction after the Lord hath increased them to the number of 50 householders, shall then forthwith appoint one within their town to teach all such children as shall resort to him to write and read, whose wages shall be paid either by the parents or masters of such children or by the inhabitants in general, by way of supply, as the major part of those that order the prudentials of the town shall appoint; provided, those that send their children be not oppressed by paying much more than they can have them taught in other towns; and it is further ordered, that where any town shall increase to the number of 100 families or householders, they shall set up a grammar school, the master thereof being able to instruct youth so far as they may be fitted for the university, provided, that if any town neglect the performance hereof above one year, that every such town shall pay 5 pounds to the next school till they shall perform this order.[1]

In connection with this law certain important facts should be noted. The law represented the first comprehensive legislation for secondary education in America and established principles of general educational policy which were of far-reaching effect on American education. Therein it is to be observed that the school was a "town" or public school, although the law made it optional with towns whether fees should be charged or the support of the school be a town responsibility. It is further to be observed that the curriculum of the school was specifically defined as one designed to provide for admission to the college, which, at that time, could mean but one thing — the narrow classical curriculum. Still further it is to be observed that the law established a general system of secondary schools. All these features were later made to cover the state of Massachusetts, which until 1820 included Maine.

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[1] *Records of the Governor and Company of the Massachusetts Bay in New England*, November 11, 1647, p. 203.

50. Further legal provision in Massachusetts. The essential characteristics of the law of 1647 remained the basis of educational legislation in Massachusetts throughout the period of the Latin grammar school. Laws passed in 1671, 1683, 1701, 1718, and 1789 increased the amount of penalty for non-compliance with the requirement for the establishment of the grammar school. The law of 1683 provided for the establishment of two Latin grammar schools in towns of five hundred families or householders. The law of 1789 provided that "every town or district containing two hundred families, or householders, shall be provided with a grammar school Master of good morals, well instructed in the Latin, Greek and English languages."[1] This law remained in force without material modification until 1827, but its operation was practically nullified by a law passed in 1824 which exempted towns containing less than five thousand inhabitants from maintaining a Latin grammar school on conditions easily met. Out of 296 towns enumerated in the census lists of Massachusetts in 1820 between 173 and 215 towns were required to maintain a Latin grammar school according to the law of 1789. By the law of 1824 all but seven (Boston, Salem, Nantucket, Newburyport, Charlestown, Marblehead, Gloucester) were released from the necessity by easy alternative conditions. The passage of the high school law of 1827 eliminated the Latin grammar school in Massachusetts as far as legal mandate was concerned. It is, perhaps, needless to state that the law requiring Latin grammar schools had never met with even a fair degree of compliance.

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[1] Laws of the State of Massachusetts, 1789, chap. XIX, secs. 1–6.

51. Legal provision in other colonies. In the Plymouth Colony an attempt was made in 1667 to establish a grammar school and the General Court decided that each town of fifty families should raise funds for that purpose. The attempt was unsuccessful. In 1670 the Court granted profits from certain fisheries toward the establishment of a free school. The county of Plymouth embraced this opportunity. After 1692 the Plymouth Colony was united with the Massachusetts Bay Colony and the laws of the latter were in effect in the whole State. Maine was a part of Massachusetts until 1820 and hence the legal provision for grammar schools was the same there as in Massachusetts. From 1641–1679 New Hampshire was also a part of Massachusetts and hence more or less affected by the legislation in Massachusetts. When the separation took place a general school law was passed (1680) in New Hampshire but that and subsequent laws were so neglected that in 1719 a law was enacted which was a close copy of the law of 1647 passed by the Massachusetts Bay Colony. The law of 1650 as passed by the Connecticut Colony was an almost verbatim copy of the same law and this remained essentially the same throughout the colonial period. In Rhode Island no comprehensive legislation came about until 1800. Vermont was first settled in 1724 and its first law affecting general education did not come until the adoption of the constitution of 1777. In Connecticut, in 1666, the united colonies were divided into four counties, with Hartford, New London, New Haven, and Fairfield the chief town in each and six years later the Court granted to each county six hundred acres of land "to be improved in the best manner that may be for the benefit of a grammar school . . . and to no other use or end whatsoever." And it was ordered, further, "That in every county town there shall be set up and kept a grammar school for the use of the county, the master thereof being able to instruct youths so far as they may be fitted for college." In the other colonies, while partial legislation was made at times, no such mandatory and comprehensive law was passed affecting secondary education directly within the period of the grammar school. It is to be noted that in Massachusetts the unit of the school system was the town. This was also true of New Hampshire and the earlier system of Connecticut. Later the county unit was employed in Connecticut. The county unit was also found in Maryland.

52. The Latin school in New England and elsewhere. The Latin grammar school developed first and at its best in New England and particularly in Massachusetts, although examples were to be found in most of the original colonies. Statistics concerning the establishment of secondary schools during the colonial period are difficult to secure, if indeed the requisite data exist. Small has estimated the number of Latin grammar schools in existence in New England up to 1700 at about forty, of which twenty-four were found in Massachusetts.[1] Eight of these had been founded before 1650. Concerning grammar schools in the eighteenth century Small says: [2]

> Meanwhile (previous to the law of 1789) the term "grammar school" had practically disappeared from use, the district-school had taken away the central authority, the old form of school had been forgotten, and there was fastened upon the state the district-school system, which required fifty years of strenuous effort to dislodge. The grammar school had practically disappeared from New England at the end of the eighteenth century.

While somewhat exaggerated, this statement is essentially correct. Just how much the district-school system had to do with the downfall of the grammar school in New England it would be difficult to determine. Its effect in that direction was probably not small. Two other powerful influences, however, were at work to interfere with the growth of the Latin school. The first was the fact that the school was designed for boys only who were preparing for college. The law reduced this limitation to an absurdity in Massachusetts where at periods apparently more schools were required than there were boys entering college in any one year during the colonial period.[1] It must be remembered that the same law limited the aim of the grammar school to preparation for the university. Hence the social demand for grammar schools, in point of number, was far behind the legal requirements and the records are full of evidence of the constant endeavor by towns to evade the law and by the State to enforce it. The second factor interfering with the development of the grammar school during the last quarter of the eighteenth century was the growth of the academy. This movement will be outlined in following sections. It may be noted here, however, that the rise of the academy was probably as much a result as a cause of the failure of the Latin grammar school.

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[1] Small, W. H., "The New England Grammar School, 1635–1700," *School Review*, vol. x, pp. 513–31.

[2] Small, W. H., "The New England Grammar School, 1700–1800," *School Review*, vol. XIV, pp. 42–56.

II. The Academy

53. The origin of the academy in America. Fundamentally the origin of the academy movement is found in the social changes of the sixteenth and seventeenth centuries which rendered the existing classical schools inadequate for contemporary needs. The breaking away from traditional schools was found in England in the rise of the academy as early as the beginning of the seventeenth century, in Scotland about the middle of the eighteenth century, and in

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[1] Inglis, A. J., *The Rise of the High School in Massachusetts*, pp. 65–70.

America about the same time. This movement was to some extent paralleled in Germany by the development of the *Realschule* as evidenced by Hecker's school in Berlin (established in 1747), which included in its curriculum, in addition to the classical studies, such subjects as German, French, drawing, geography, arithmetic, algebra, geometry, trigonometry, history, natural history, physics, and philosophy. The same tendency is found in the Scotch academy. Thus Kerr:[1]

> About the middle of the eighteenth century there was in many quarters a desire for schools with a more liberal and practical curriculum than that in use in the old grammar schools. "Academies" was the name chosen for such institutions. They were meant to supplement grammar schools by introducing commercial and science subjects, but in many cases they superseded them or became their rivals. Perth has the honor of being the oldest academy in Scotland. It was founded in 1760.

For more than two centuries secondary education in the American colonies was restricted to that provided in the Latin grammar school with its limited classical curriculum and its provision primarily for those who were destined to enter the higher professions through the college. By the middle of the eighteenth century it had become evident to many that such a school was inadequate for the needs of the American youth and that a broader form of secondary education was needed. The basis of the academy movement in America was, then, recognition of the need for a form of secondary education of broader scope and better suited to contemporary needs.

54. The Franklin Academy in Philadelphia. Nowhere did the reaction away from the narrow classicism of the Latin grammar school find a more enthusiastic proponent than in Benjamin Franklin. In 1743 Franklin drew up the plan of an academy but did not publish it until 1749. Instruction in the Publick Academy in the City of Philadelphia began in 1751 with its three departments, the Latin School, the English School, and the Mathematical School. Shortly after the institution was reincorporated as the "College, Academy, and Charitable School of Philadelphia" and was given the power of conferring degrees. The charter of this "college" was revoked in 1779 and the University of Pennsylvania established in its stead. It is evident that this academy was a different type of school from any previous institution. It should also be evident — and that fact has not always been properly recognized — that it was by no means typical of the academy as it developed in America.

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[1] Kerr, J., *Scottish Education, School and University*, p. 162.

It is claimed that the Moravian Academy at Bethlehem was established in 1742, the Moravian school for girls in Germantown in 1742, and Nazareth Hall in 1743. It is not clear that those schools were of secondary-school rank. If so they antedated the academy at Philadelphia.

55. The academy in Massachusetts. The academy movement in Massachusetts had its beginning in the establishment of the Dummer Academy in South Byfield and of the Phillips Academy at Andover. Although the former was not incorporated until 1782 its history dates from the legacy of Lieutenant-Governor Dummer in 1761 and the opening of the school in 1763. Of the Phillips Academy at Andover the endowment was established by the execution of a deed of gift in 1778. In that year the school was opened and in 1780 the academy was incorporated. By 1800 seventeen academies had been incorporated in the State of Massachusetts. Before the founding of the first public high school more than thirty-six academies had been founded in the State — far more than the number of surviving Latin grammar schools. The growth of the academy movement in Massachusetts may be observed from the following table.

TABLE LXXIV. ACADEMIES INCORPORATED IN MASSACHUSETTS, 1780–1870 [*]

Dates	*Number*		*Dates*	*Number*	
	New	*Total*		*New*	*Total*
1780–1790	6	6	1831–1840	46	114
1791–1800	11	17	1841–1850	21	135
1801–1810	11	28	1851–1860	19	154
1811–1820	8	36	1861–1870	10	164
1821–1830	32	68			

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[*] Compiled from data given in the *Fortieth Report of the Massachusetts Board of Education*, Appendix E, pp. 175–347.

Here it may be noted that, as measured by the number of academies incorporated, the period of most rapid development in Massachusetts was 1826–35 when sixty academies were incorporated within ten years, as compared with forty in the preceding forty-five years and sixty-nine in the succeeding forty years. This is, of course, not a fair criterion of the development and influence of the academy in that

TABLE LXXV. ACADEMIES AND PRIVATE SCHOOLS IN MASSACHUSETTS [†]

Year	*Number of academies*			*Number of pupils*			*Total population of state*	*Pupils per 10,000 population*
	Incorporated	*Unincorporated*	*All*	*Incorporated*	*Unincorporated*	*All*		
1835	...	...	...	...	...	24,278	683,861	350
1840	78	1,308	1,386	3,701	28,635	32,336	737,699	438
1845	66	1,167	1,233	3,939	26,762	30,701	856,531	358
1850	67	845	912	3,717	19,534	23,251	994,514	234
1855	71	646	717	4,716	17,571	22,287	1,132,364	197
1860	65	640	705	3,561	15,933	19,494	1,231,066	158

[†] Compiled from data given in the Abstracts of Massachusetts School Returns for the years 1834–60. For complete data see Inglis, A. J., *The Rise of the High School in Massachusetts*, p. 57.

state, but it is indicative of the general trend of the academy movement. Table LXXV shows the influence of the academy in Massachusetts during the middle of the nineteenth century.

Since younger pupils are doubtless included in large numbers in these figures they cannot be interpreted with any exactness. Nevertheless they show clearly the great influence of the academy and private schools at the middle of the nineteenth century and its decline as the high-school movement developed after 1840. The academy movement in Massachusetts developed somewhat earlier than in most parts of the country (New York State perhaps excepted). It also declined before the advance of the high-school movement at an earlier date.

56. The academy movement in other States. Apparently the sort of education introduced by the academy met a very definite need in the field of secondary education. Gaining an early and firm hold, especially in Massachusetts, New York, Pennsylvania, Maryland, Virginia, and North Carolina, toward the middle of the nineteenth century the academy had spread rapidly throughout the country. This is to be seen from the figures presented in Table LXXVI.

In considering such figures it must, of course, be remembered that the number of academies existing in 1850 includes many which were institutions enrolling elementary- and secondary-school pupils or even elementary school students alone so that any direct comparison of conditions in 1850 and in 1910 would be quite unfair. Nevertheless the figures presented indicate the important position which academies had assumed in this country by the middle of the nineteenth century.

The academy movement during the last half of the nineteenth century was intimately related to the development of the public high-school movement and is best considered in that connection in later sections.

TABLE LXXVI. SHOWING THE NUMBER OF ACADEMIES AND PUPILS ATTENDING THEM IN 1850. ALSO THEIR DISTRIBUTION WITH REFERENCE TO POPULATION. FIGURES ARE PRESENTED ALSO FOR PUBLIC AND PRIVATE SECONDARY SCHOOLS IN 1910–1911 FOR PURPOSES OF COMPARISON *

Section of the Country	*Academies in 1850*				*All Secondary Schools 1910*			
	Number of		*Population to each*		*Number of*		*Population to each*	
	Schools	*Pupils*	*School*	*Pupil*	*Schools*	*Pupils*	*School*	*Pupil*
New England	1,007	40,866	2,709	67	850	118,741	7,716	55
Middle Atlantic	1,636	82,923	3,606	71	1,996	239,599	9,677	81
East North Central	515	29,823	8,783	152	2,909	266,415	6,274	69
West North Central	238	9,952	3,861	88	1,339	112,351	5,671	68
South Atlantic	1,379	49,818	3,392	96	1,408	85,918	8,681	142
East South Central	931	37,559	3,613	89	787	51,309	10,686	164
West South Central	330	11,224	2,849	84	829	57,702	8,598	124
Other States	49	1,052	3,649	170	443	64,014	9,532	66
States of 1850	6,085	263,096	3,811	88	10,581	996,049	7,922	84
All present States	6,095	263,096	3,811	88	12,213	1,115,326	7,531	82

* Figures for the academies taken from the *American Journal of Education*, vol. I, p. 368 (reproduced by Dexter, E. G., *A History of Education in the United States*, p. 96). Figures for the schools of 1910–11 taken from *Public and Private Schools*, Bulletin of the Bureau of Education (1912), no. 22, p. 42. Figures for population taken from *Report of the Thirteenth Census* (1910), vol. I, pp. 30–31. Computation and compilation by the writer.

57. The control and support of the academy. By the end of the eighteenth century the Latin grammar school of the colonies had become an institution of the past except in a few important centers. The high-school movement did not gain any great impetus until after the middle of the nineteenth century. Hence it is obvious that the academy was the dominant institution of secondary education in this country from its inception in the last part of the eighteenth century until well into the second half of the nineteenth century. The Latin grammar school had been essentially a free public institution, controlled and supported by the town or state. The high school likewise was a free public institution in the fullest sense of the term. In contrast with

High S. in 1900 82 high or acad. in (1

those institutions the academy was essentially a private institution in the majority of cases, the control being invested commonly in a board of trustees or other similar body. Nevertheless it is true that all degrees of private and public control and support were exemplified, ranging from completely private and personal control to practically public control and supervision.

In Massachusetts previous to 1797 seven academies had received state aid in addition to the rights of legal existence. In that year other academies petitioned the legislature for endowments and a committee was appointed to consider those petitions and outline a plan of the public policy with regard to incorporated academies. This committee reported February 27, 1797:

> On a general view of this subject, the committee are of the opinion that the system hitherto pursued, of endowing academies with State lands ought to be continued, but with several material alterations; first, that no academy (at least not already erected) ought to be encouraged by government unless it have a neighborhood to support it of at least thirty or forty thousand inhabitants, not accommodated in any manner by any other academies, by any other college or school answering the purpose of an academy; secondly, that every such portion of the Commonwealth ought to be considered as equally entitled to grants of State lands, in aid of private donations; and thirdly, that no State lands ought to be granted to any academy but in aid of permanent funds.[1]

In the same report it was recommended that half a township of six miles square of land in Maine (which was until 1820 a part of Massachusetts) be granted to each academy which met certain conditions regarding funds. Those recommendations were adopted and from this action of the legislature it would appear that the academy in Massachusetts atter date

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[1] Report of the Committee, quoted in the *Fortieth Annual Report of the Massachusetts Board of Education,* Appendix E, pp. 207–09.

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tin Grammar school about 1700+

was recognized as early as 1797 as fulfilling in some degree the function of a quasi-public institution and as one deserving public support. That this view was accepted is clear from the following:

50 to 1860 col.

> The following principles appear to have been established, as determining the relations of the academies to the Commonwealth. They were to be regarded as in many respects, and to a considerable extent, as public schools; as a part of an organized system of public and universal education; as opening the way, for all the people, to a higher order of instruction than the common schools can supply, and as a complement to them. Towns, as well as the Commonwealth, were to share, with individuals, the character of founders, or legal visitors of them.[1]

igh school 1850 to present

The organization of the academies as component parts of a comprehensive State system reached its highest level in New York State. In 1787 the academies in that State were made a part of the University of the State of New York which had been organized three years before. Here also the policy of endowing academies with State funds was adopted. In the earlier period special grants were made to academies, and a permanent fund, known as the Literature Fund, was established in 1813. The organized system of academy support and control which thus grew up in New York State was an important element prolonging the life of the academy and in some ways delaying the high-school movement in that State.

The policy of aiding academies by State appropriations of public money or land was somewhat general throughout the country and such academies were regularly looked upon as quasi-public schools. It is to be noted, however, that in New York State only did the State exercise any sort of adequate supervision and control, so that in general we find the phenomenon of schools essentially controlled by private individuals, religious denominations, or self-perpetuating boards of trustees, in extensive amount supported by public money.

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[1] Report of the Committee, quoted in the *Fortieth Annual Report of the Massachusetts Board of Education*, Appendix E, pp. 207–09.

58. The curriculum of the academy. It was the design of the early founders of academies to establish schools, which, as contrasted with the Latin grammar schools, should provide a rather extensive training covering a number of subjects of study having value aside from preparation for college, courses of study which should be better fitted to the changed conditions of life and society, and be of practical benefit to pupils in whatever kind of life they were destined to follow. This aim is manifest in the proposals promulgated by Franklin and in all his activities connected with the academy at Philadelphia. It is also manifest in the constitution proposed by the founders of the Phillips Academy at Andover wherein the aim was stated to be

> to lay the foundation of a public free school or ACADEMY for the purposes of instructing Youth, not only in English and Latin Grammar, Writing, Arithmetic, and those Sciences wherein they are commonly taught; but more especially to learn them the GREAT END AND REAL BUSINESS OF LIVING . . . it is again declared that the *first* and *principal* object of this Institution is the promotion of TRUE PIETY and VIRTUE; the *second*, instruction in the English, Latin, and Greek Languages, together with Writing, Arithmetic, Music, and the Art of Speaking; the *third*, practical Geometry, Logic, and Geography; and the *fourth*, such other liberal Arts and Sciences or Languages, as opportunity and ability may hereafter admit, and as the TRUSTEES shall direct.

As early as 1799 we know that the following subjects were taught at the Phillips Academy at Exeter: the English, French, Greek, and Latin languages, geography, arithmetic, practical geometry, rhetoric, logic, natural philosophy (physics), history, astronomy, moral philosophy, and natural law. At the same academy in 1818 were given studies in a "Classical Department" and an "English Department." The studies of the Classical Department were practically the same as those of the Boston Latin School of about the same time. The English Department included the following studies:

> *For the First Year:* English Grammar including exercises in Reading, in Parsing, and Analysing, in the correction of bad English; Punctuation and Prosody; Arithmetic; Geography, and Algebra through Simple Equations.
>
> *For the Second Year:* English Grammar continued; Geometry; Plane Trigonometry and its application to heights and distances; mensuration of Sup. and Sol.; Elements of Ancient History; Logic; Rhetoric; English Composition; Declamation and exercises of the forensic kind.
>
> *For the Third Year:* Surveying; Navigation; Elements of Chemistry and Natural Philosophy with experiments; Elements of Modern History, particularly of the United States; Moral and Political Philosophy, with English Composition, Forensics, and Declamation continued.

The development of the academy coincided with the development of the newly established Republic and this movement was marked by the extended curriculum offered to boys and girls who were to become citizens of that Republic. It also coincided with the development of the sciences and the part played by them in the nineteenth century. This also was reflected by the curriculum of the academy. Subjects of study were constantly added to the curriculum until it covered almost every phase of learning. This is indicated by the range of subjects reported to the Regents of the University of the State of New York by the academies in that State in 1837:[1]

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[1] Quoted from Monroe, P., *Principles of Secondary Education*, p. 58, with the permission of the publishers, The Macmillan Company.

Arithmetic, algebra, architecture, astronomy, botany, bookkeeping, Biblical antiquities, biography, chemistry, composition, conic sections, constitution of the United States, constitution of New York, elements of criticism, declamation, drawing, dialing, English grammar, evidences of Christianity, embroidery, civil engineering, extemporaneous speaking, French, geography, physical geography, geology, plane geometry, analytic geometry, Greek, Grecian antiquities, German, general history, history of the United States, History of New York, Hebrew, Italian, Latin, law (constitutional, select revised statutes, criminal, mercantile, Blackstone's Commentaries), logic, leveling, logarithms, vocal music, instrumental music, mapping, mensuration, mineralogy, mythology, natural history, navigation, nautical astronomy, natural theology, orthography, natural philosophy, moral philosophy, intellectual philosophy, penmanship, political economy, painting, perspective, physiology, English pronunciation, reading, rhetoric, Roman antiquities, stenography, statistics, surveying, Spanish, trigonometry, topography, technology, principles of teaching.

With the radical changes in the curriculum came also tendencies to change the methods of teaching employed. About the curriculum of the Latin grammar school had been developed a body of traditional method which continued to be the method employed in the teaching of Latin and Greek and also was transferred to the newer language studies. The other subjects now introduced were not fortified with traditional methods and hence there was possible experimentation in the methods of teaching those subjects. Formal catechetical and recitation methods continued to be employed but some of the newer subjects demanded an emphasis on practical use that were not to be found in previous methods, e.g., surveying, navigation, the sciences, painting, declamation, stenography, bookkeeping, etc. In the case of political economy, evidences of Christianity, law, etc., the methods employed emphasized the acquisition of informational facts, frequently of a type wherein the textbook was arranged in question-answer form. Textbooks rapidly multiplied and introduced new methods, some of which were of temporary vogue while others influenced all later teaching.

59. Secondary education for girls in the academy. In colonial times secondary or higher education for girls was entirely lacking. In Dorchester, Massachusetts, the question of the admission of girls to the grammar school was raised at the time of the founding of the school, but it evidently did not result in any such provision. In 1784 the girls of that town were permitted to attend the grammar school (building?) in the summer, but it is doubtful that anything ever resulted from that privilege. Early in the history of the academy movement, however, we find academies established for girls alone and for both sexes together. Of academies for girls alone the school at Germantown founded in 1743 may have been the first although there is some question of the character of that school. At any rate a school for girls was established by Dr. Rush in Philadelphia in 1780. Of coeducational academies the Leicester Academy in Massachusetts was probably the first. That school was coeducational from its establishment in 1784. This was followed in Massachusetts by a number of academies either for girls alone or for both sexes and the conception of secondary education for girls was thus firmly implanted in the public mind.

Some of the academies established for girls were of a distinctly inferior character to those for boys and emphasized particularly the "polite accomplishments" of the period. Foreshadowing these schools was a school such as that whose announcement is quoted by Monroe for the Armston School (1772), in which such subjects as the following were offered:[1]

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[1] Monroe, P., *Cyclopedia of Education*, vol. II, p. 120; courtesy of the publishers, The Macmillan Company.

> Petit Point in Flowers, Fruit, Landscapes and Sculpture, Nun's Work, Embroidery in Silk, Gold, Silver, Pearls, or embosed, Shading of all kinds, in the Various Works in Vogue, Dresden Point Work, Lace Ditto, Catgut in different Modes, flourishing Muslin, after the newest Taste, and most elegant Pattern Waxwork in Figure, Fruit, or Flowers, Shell Ditto, or grotesque, Painting in Water Colours and Mezzotinto; also the Art of taking off Foliage, with several other Embellishments necessary for the Amusement of Persons of Fortune who have Taste.

Such a school was the prototype of the later "finishing school."

60. Effect of the academy movement. The effect of the academy on the development of secondary education in the United States was both good and bad. On the credit side of its account may be placed at least four important contributions which secondary education in America received from the academy movement: (1) it introduced, or at least met, the conception that secondary education should be provided for the large number of boys and girls not preparing to enter college; (2) it enriched and extended the course of study; (3) it introduced and developed secondary education for girls; (4) it popularized if not democratized secondary education in America and prepared the public mind for universal secondary education which was to be attempted later through the public high school. To these four contributions of the academy we may add another item in the fact that private initiative founded and fostered secondary education at a period when legislatures and local authorities failed to provide an institution adequate to meet the needs of society. For a period of more than three quarters of a century the academy was the dominant form of secondary education in the country, during a large part of that time it was the only form of secondary education in many regions, and it exerted an influence on secondary education in the United States which lasted throughout the nineteenth century in spite of the rapid growth of the public high school during the last half or the last quarter of that century.

On the debit side of the ledger we must enter accounts against the academy of the following items: (1) The academy was essentially a private, sometimes a denominational or at least a religious institution. The very fact that, while dependent on private or denominational initiative and interest for establishment and control, academies were "to be regarded as in many respects and to a considerable extent; public schools; as a part of an organized system of public and universal education" constituted its worst defect. (2) With the possible exception of academies in New York State, the academies were not organized into a State system and standards were not established. (3) While the academies did popularize secondary education in the United States they did not democratize it in the sense that they equalized educational opportunity for all. Here two characteristics of the academy interfered: first, in spite of numerous free or nearly free scholarships, etc., the burden of expense fell on the pupil or his parents rather than on the public; secondly, since academies were located more according to the choice or whim of the founders and were in part "boarding" schools, attendance at them was determined as much by their accessibility as by need and desire. This again affected the matter of expense. (4) While the academy did much to pave the way for the later public high school, both by establishing a form of organization, curriculum, etc., and by preparing the mind of the public for extensive secondary education, it also constituted the greatest impediment to the early development of a really public secondary school. Though the high-school movement started at the beginning of the second quarter of the nineteenth century, its victory over the private school and academy was not complete until the end of the century, if indeed it has yet fulfilled its destiny in that respect.

In this connection it is worthy of note that practically every new movement in secondary education has begun in some private or semi-private institution and only gradually has been adopted by the public high school. Instances of this may be found in the manual training movement commercial education, vocational education and vocational guidance, the six-year high-school plan, and other movements.

With the development of the public secondary school, many academies were absorbed into the public system, a few grew into colleges or other higher institutions, and many died through lack of support, high-school competition, or for other reasons. The lessening importance of the academy and the private school and the increasing importance of the public high school during the past quarter-century are best considered in connection with the history of the public high-school movement. In passing, however, it may be noted that non-sectarian private secondary schools (including academies) have decreased from 1182 schools with 57,385 pupils in 1895–96 to 662 schools with 51,215 pupils in 1914–15, while sectarian secondary schools maintained by the Roman Catholic Church have increased from 271 schools with 11,728 pupils in 1895–96 to 975 schools with 56,182 pupils in 1914–15. Other sectarian secondary schools have increased but slightly.

III. The Public High School

61. Secondary education in the early nineteenth century. Of the colonial Latin grammar schools a few only had survived the educational decline in public education of the eighteenth century, the extension of the district system, and the rapid development of the academy in the late eighteenth century. Here and there, particularly in New England, a few of the grammar schools survived. The Boston Public Latin School renewed its power with important modifications under the able administration of Gould (1814–28) and several other Latin grammar schools continued to flourish. However, the demands of society after the birth of the new nation had forever relegated the Latin grammar school as a general public secondary school to the history of the past. The institution which had replaced it met some of the newer conceptions of education, but the academy was essentially a non-public or at best but a quasi-public institution which could not satisfy the ideals of a thoroughly public secondary school. Hence there was need for a new type of secondary school which should involve the newer conceptions of the aims and methods of secondary education as exemplified in the academy and at the same time fulfill the requirements of a public institution. This idea was especially strong in Massachusetts and its accomplishment there marked the beginning of the high school in America.

62. The English Classical (High) School of Boston. Sentiment for this type of secondary school first bore fruit in Boston where the English Classical School was founded in 1821. The aim of those who advocated this school is indicated in the report of a sub-committee which had been appointed to consider the question of its establishment:

> The mode of education now adopted, and the branches of knowledge that are taught at our English grammar schools are not sufficiently extensive nor otherwise calculated to bring the powers of the mind into operation nor to qualify a youth to fill usefully and respectably many of the stations, both public and private, in which he may be placed. A parent who wishes to give a child an education that shall fit him for active life, and shall serve as a foundation for eminence in his profession, whether mercantile or mechanical,

> is under the necessity of giving him a different education from any which our public schools can now furnish. Hence, many children are separated from their parents and sent to private academies in this vicinity, to acquire that instruction which cannot be obtained at the public seminaries.[1]

Its aim was further stated in the *Regulations of the School Committee* for 1833:

> It was instituted in 1821, with the design of furnishing the young men of the city who are not intended for a collegiate course of study, and who have enjoyed the usual advantages of the other public schools, with the means of completing a good English education to fit them for active life or qualify them for eminence in private or public station.[2]

Here it is to be noted that while the conception of college preparation as a function of secondary education was still held (and exemplified in Boston in the Public Latin School which still continued) there was introduced in public secondary education the conception that another function was also involved in secondary education — that of providing training for boys destined for other walks of life, "whether mercantile or mechanical." This conception was in some degree reflected in the first course of study in that school:

> *First Class:* Composition; reading from the most approved authors; exercises in criticism, comprising critical analyses of the language, grammar, and style of the best English authors, their errors and beauties; Declamation; Geography; Arithmetic continued.
>
> *Second Class:* Composition, Reading, Exercises in Criticism, Declamation; Algebra; Ancient and Modern History and Chronology; Logic; Geometry; Plane Trigonometry, and its applications to mensuration of heights and distances; Navigation; Surveying; Mensuration of Surfaces and Solids; Forensic Discussions.

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[1] *Report of the Sub Committee* quoted in *Catalogue of the English High School,* Boston, 1890. Also quoted by Brown, E. E., *The Making of Our Middle Schools,* p. 299.

[2] *Regulations of the School Committee* (1833), pp. 14–16.

Third Class: Composition; Exercises in Criticism; Declamation; Mathematics; Logic; History, particularly that of the United States; Natural Philosophy, including Astronomy; Moral and Political Philosophy.[1]

In this course of study it is to be noted that the Boston school took over the newer subjects of study from the academy, that great emphasis was placed on the study of English, and that an attempt was made to provide a certain amount of "vocational education." The practical side of secondary education found manifestation in the study of English, in the mathematics to a certain degree, in navigation, surveying (important in those days in New England), and in the sciences. This tendency was furthered in the course of study for 1823–24 when bookkeeping, "by single and double entry," "elements of Arts and Sciences," and "Practical Mathematics" were added to the program of studies, together with Natural Theology, Sacred Geography, and Evidences of Christianity — "vocational" and "moral" training at the beginning of the high-school movement.

The school was first called "The English Classical School." The name "English High School" occurs first in the records of the Boston School Committee of June 23, 1824, and the term was in common use until 1832. In that year the original name was restored only to be changed once more in 1833 when the name "English High School" was formally adopted.

63. The Girls' High School of Boston. The secondary education of girls had been begun in the academy during the last part of the eighteenth century. The first public institution for the secondary education of girls was that established in Boston in 1826. Its character may be seen from the course of study adopted:[2]

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[1] *Report of the Sub-Committee,* mentioned in note 1.

[2] *The High School for Girls, Boston: An Account* (February, 1826), pp. 12–13.

First Year

Required: No. 1. Reading...2. Spelling...3. Writing words and sentences from dictation...4. English Grammar with exercises in the same...5. Composition...6. Modern and Ancient Geography...7. Intellectual and written arithmetic...8. Rhetoric...9. History of the United States.

Allowed: Logic, or Botany.

Second Year

Required: Nos. 1, 2, 5, 6, 7, 8, continued...10. Bookkeeping by single entry...11. Elements of Geometry...12. Natural Philosophy...13. General History...14. History of England...15. Paley's Natural Theology.

Allowed: Logic, Botany, Demonstrative Geometry, Algebra, Latin, or French.

Third Year

Required: Nos. 1, 5, 12, 15, continued...16. Astronomy... 17. Treatise on the use of globes...18. Chemistry...19. History of Greece...20. History of Rome...21. Paley's Evidences of Christianity.

Allowed: Logic, Algebra, Principles of perspective, projection of maps, Botany, Latin or French.

The success of this school was so great that more girls wished to enter than could be accommodated. This gave rise to the necessity of increasing the facilities for instruction in this school or of extending the scope of the elementary schools for girls — the writing and grammar schools. The latter course was adopted and the High School for Girls passed out of existence in 1828, not to be revived until the middle of the century, when it was reëstablished as a training school for teachers. This had been one of its chief purposes in the original establishment.

64. The Massachusetts law of 1827. Six years after the establishment of the English Classical (High) School and the year following the establishment of the High School for

Girls in Boston the State of Massachusetts enacted a law requiring the establishment of high schools throughout the State. That law (operative March 10, 1827) was the real beginning of the high-school movement and deserves somewhat extended notice here. The part affecting secondary education directly reads as follows:

> And every city, town, or district, containing five hundred families or householders, shall be provided with such teacher or teachers for such term of time as shall be equivalent to twenty-four months, for one school in each year, and shall also be provided with a master of good morals, competent to instruct, in addition to the branches of learning aforesaid, the history of the United States, bookkeeping by single entry, geometry, surveying, and algebra; and shall employ such master to instruct a school, in such city, town, or district, for the benefit of all the inhabitants thereof, at least ten months in each year, exclusive of vacations, in such convenient place, or alternately at such places in such city, town, or district, as the said inhabitants, at their meeting in March, or April, annually shall determine; and in every city, or town, containing four thousand inhabitants, such master shall be competent in addition to all the foregoing branches, to instruct the Latin and Greek languages, history, rhetoric, and logic." [1]

In spite of the various retroactive measures of 1829 (repealed 1835), of 1840 (repealed 1848), and 1850 (repealed 1857), this law remained the basis of all subsequent legislation affecting secondary education in Massachusetts and a model for the country. Significant, however, were the provisions of the act of 1857 which changed the course of study so as to include algebra and the history of the United States in the curriculum of the elementary school, natural philosophy, chemistry, botany, Latin, and the civil polity of Massachusetts and of the United States in the curriculum of high schools of lower grade (in towns of five hundred families), and French, astronomy, geology, intellectual and moral science, and political economy in the curriculum of high schools of more than four thousand inhabitants.[1] After those changes no important modifications were made in the high-school law until the revision of 1898.

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[1] Laws of the State of Massachusetts, January Session, 1827, chap CXLIII, secs., 1, 19, 21, especially.

The term "high school" does not appear in the laws which created that type of school in Massachusetts until 1840. In common use, however, the term was applied almost from the beginning in 1827 to designate the type of school referred to in the act of that year. The term was applied indiscriminately to schools in towns of five hundred families or those in towns of four thousand inhabitants and, although the law distinguished high schools of two different types, once a high school was established it tended to include in its curriculum all the studies prescribed for high schools of higher grade. Misuse of the term and evasion of the law were, of course, frequent.

It is to be noted that, while no specific mention is made of boys and girls in the law, except as they were included in the phrase "for the benefit of all the inhabitants thereof," both girls and boys were regularly admitted to the high school from the very beginning. The absence of contemporary comment on this fact indicates how thoroughly the idea of coeducation had been inculcated through the academy movement.

65. The public high school in Massachusetts. The figures presented in the following table will fairly indicate the development of the high school in Massachusetts from the passage of the original law in 1827 up to 1865. By the latter date the high school had assumed a stable position in the State, the legal requirements regarding the establishment of schools had met with a fair degree of compliance, the list of subjects to be taught had assumed a form destined to endure for the rest of the century, the graded-school system was well under way, the academy had begun to give way to the public high school as the preëminent institution of secondary education, and a favorable attitude on the part of the public toward the high school had been created.

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[1] Acts and Resolves, 1857, chap. 206, secs. 1, 2, 3. On the whole question of high-school legislation in Massachusetts see Inglis, A. J., *The Rise of the High School in Massachusetts*, chaps. II–III.

TABLE LXXVII. THE ESTABLISHMENT OF HIGH SCHOOLS IN MASSACHUSETTS *

Census	*Number required by law*	*Established according to law*	*Percentage meeting the law*	*Established but not required*	*Total number established*
1830	35	3	8.6	0	3
1840	44	16	36.4	2	18
1850	76	42	55.3	5	47
1855	120	77	64.2	10	87
1860	128	86	67.2	16	102
1865	130	88	68.0	20	108

* Inglis, A. J., *The Rise of the High School in Massachusetts*, pp. 38, 42–45.

The unstable status of some of the high schools established and the fact that in some cases the so-called "high schools" were so in little more than name render this table somewhat unreliable, but the general growth is obvious. It will be noted that for nearly a quarter of a century after the passage of the mandatory law for high schools the development was comparatively slow. There is abundant evidence that many factors combined to interfere with that development — the dominance of the academy, the prevalence of the "district system" for common schools involving a conflict of interest, control, and policy between the "town" high schools and the district common schools, the difficulty of meeting the mandate of the law in smaller towns and sparsely populated districts, the ever-present financial problem, the various reactionary laws passed as relief measures in 1829, 1840, and 1850, the lack of any centralized authority until the establishment of the Board of Education in 1837.

The mere number of high schools is not a good measure of their real effectiveness. A better measure of the degree of their influence would be the extent to which they served the population. The following table will give an indication of the situation in Massachusetts in 1865.

TABLE LXXVIII. DISTRIBUTION OF HIGH SCHOOLS IN MASSACHUSETTS ACCORDING TO POPULATION IN 1865 *

	Population	*Percentage of population served*
Total population of State, census of 1865	1,267,031	
In towns required by law to maintain high school	961,297	75.9
In towns required to maintain high schools and meeting the law	828,643	65.2
In towns required to maintain high schools and not meeting the law	132,654	10.5
In towns not required to maintain high schools but doing so	37,238	2.9
Total in towns maintaining high schools	865,881	68.3

* Inglis, A. J., *op. cit.*, p. 48.

It has been intimated that many of the so-called "high schools" were not deserving of that title. This is undoubtedly true, and it is a difficult task to judge the standing of some schools. Basing the estimate on a study of almost every report of every town in Massachusetts from 1827 to 1865, I feel safe in asserting that the number was certainly not less than sixty-three in 1861 and in all probability was far greater. The number sixty-three was determined from definite data preserved.[1]

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[1] Inglis, A. J., *op. cit.*, pp. 49–51.

In Massachusetts the public high school fought its way successfully against the academy much earlier than was the case in most States. The following table presents data showing the status of the academy and the high school in Massachusetts, where the high school first developed, and in New York, where the academy gained its firmest foothold.

TABLE LXXIX. GROWTH OF THE HIGH SCHOOL AND OF THE ACADEMY IN MASSACHUSETTS AND IN NEW YORK STATE*

Period	*Massachusetts*				*New York*			
	High schools established		*Academies incorporated*		*High schools established*		*Academies incorporated*	
	Period	*Total*	*Period*	*Total*	*Period*	*Total*	*Period*	*Total*
Before 1820. .	. . .	. . .	. . .	36	. . .	. . .	. . .	52
1820–1840. . .	18	18	78	112	10	10	176	228
1840–1860. . .	94	102	30	142	31	41	183	411

* Cf. Inglis, A. J., *op. cit.*, pp. 11, 46, 155.

66. The high-school movement in the United States. With a few exceptions the high schools of this country owe their basis in aim, theory, and practice to the high school first created and earliest developed in Massachusetts. For the first fifteen or twenty years after the beginning of the movement progress was slow. Previous to 1840 not more than eighteen high schools had been established in Massachusetts and probably a less number outside that State. Within the next two decades (1840–1860) the movement spread rather rapidly, especially in Massachusetts, Ohio, and New York. Next to Massachusetts, Ohio seems to have led in the establishment of high schools, and the growth of the high school in that State is of particular interest. The movement there began with the establishment of the Central High Schools in Cleveland and Columbus in 1846. For the period up to 1860 the State Commissioner reported as follows:[1]

> There were few, if any, High Schools in the State fifteen years ago: and not more than twenty when our general school law was enacted in 1853. Since 1855 they have increased from 91 to 161, being an average increase of 12 per annum. During that time the teachers in these schools have increased from 196 to 319 and the pupils from 7522 to 13,183.

Numerous estimates have been made of the number of public high schools established and maintained in various parts of the country for the period from the founding of the English Classical (High) School in Boston up to the year 1889–90 when the *Reports of the United States Commissioner of Education* began to give some data. None of those estimates appears to be very reliable. Commissioner Harris estimated the number of high schools in operation in the United States in 1870 at about 160 and those in operation in 1880 as about 800.[2] Those figures are undoubtedly a gross underestimate, but how much so it would be difficult to say in the present state of our knowledge. Dexter has analysed the data given in the Report of the Commissioner of Education for 1902 to determine the number and distribution of the 3,179 public high schools reporting to the Department of Education the dates of their establishment. His table is reproduced on the following page.

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[1] *Seventh Annual Report of the Ohio State Commissioner of Common Schools* (1860), p. 45. Cf. also Inglis, A. J., *op. cit.*, pp. 156–57.

[2] Harris, W. T., "The Growth of the Public High Schools in the United States," *Proceedings of the National Education Association* (1901), p. 174.

TABLE LXXX. ESTABLISHMENT OF PUBLIC HIGH SCHOOLS BY DECADES IN THE VARIOUS DIVISIONS OF THE COUNTRY *

Decades	*North Atlantic*	*South Atlantic*	*South Central*	*North Central*	*Western*	*Total*
1820–1829	6	...	1	...	...	7
1830–1839	10	1	1	2	...	14
1840–1849	27	4	3	9	...	43
1850–1859	67	1	5	34	1	108
1860–1869	60	7	3	103	4	177
1870–1879	121	25	27	298	8	479
1880–1889	142	47	103	508	29	829
1890–1899	318	91	161	595	155	1320
1900–1902	31	17	30	93	31	202
Total to 1902	782	193	334	1642	228	3179

* Dexter, E. G., *A History of Education in the United States*, pp. 172–73. Cf. also Inglis, A. J., *op. cit.*, p. 155.

Although these figures are without exactness, they are to be considered as an underestimate rather than as too great and indicate the rapidity of the development of the high school in the last quarter of the nineteenth century. The same criticism applies to the figures given in Table LXXXI illustrating the development of the high school up to 1915. The nearer we come to the present the more reliable the figures become.

With all due allowance for the inaccuracies in the data available and the difficulties of interpreting conditions, we may be justified in saying that the period from 1821 to about 1870 represents the period of the beginning of the high school movement for the country at large, the period of about 1870 to 1890 the period of growth and development, and the period from about 1890 to the present the period of the dominance of the public high school in the field of secondary education.

TABLE LXXXI. GROWTH OF THE PUBLIC HIGH SCHOOL, 1890–1915*

Year	*Schools*	*Teachers*	*Students*
1890–1891	2,771	8,270	211,596
1895–1896	4,974	15,700	380,493
1900–1901	6,318	21,778	541,730
1905–1906	8,031	30,844	722,692
1910–1911	10,234	45,167	984,677
1913–1914	11,515	57,909	1,218,804
1914–1915	11,674	62,519	1,328,984

* Figures taken from *Report of the United States Commissioner of Education* (1916), vol. II, p. 449.

67. The public high school and the academy. The development of the academy and its dominance in the field of secondary education in this country until well into the last half, or even the last quarter, of the nineteenth century have been outlined earlier in this chapter. That secondary schools established and controlled by private individuals or corporations, more or less supported by public funds, threatened to become the controlling type of secondary school in the United States is obvious from the data previously presented. This tendency the public high school was forced to combat and for more than half a century the outcome of the public high-school movement was dubious. However, by the middle of the last quarter of the nineteenth century we find the high school well in the lead and its ultimate victory over the academy and private high school well assured. The situation since that time is illustrated by the figures in Table LXXXII.

With all due allowance for the incompleteness and inaccuracy of the returns made to the Federal Bureau of Education (especially for the earlier years), the growing influence of the public high school and its dominance over the private

TABLE LXXXII. THE RELATIVE PROGRESS OF PUBLIC AND PRIVATE HIGH SCHOOLS, 1889–1915 *

Year	*Per cent of number of schools*		*Per cent of number of teachers*		*Per cent of number of pupils*	
	Public	*Private*	*Public*	*Private*	*Public*	*Private*
1889–1890	60.75	39.25	55.85	44.15	68.13	31.87
1894–1895	68.37	31.63	62.26	37.74	74.74	25.26
1899–1900	75.22	24.78	66.82	33.18	82.41	17.59
1904–1905	82.32	17.68	74.29	25.71	86.38	13.62
1909–1910	85.15	14.85	78.90	21.10	88.63	11.37
1914–1915	83.85	16.15	81.68	18.32	89.55	10.45

* *Report of the United States Commissioner of Education* (1916), vol. II, p. 449.

secondary school is evident. There must always be some place for the private secondary school, and it is doubtful that the present status will ever greatly change. An extension of public supervision over privately controlled schools is probably the next step rather than any form of repression or complete control on the part of the State. Since the public school must always determine its policy in terms of the larger group, some small proportion of children will always receive better educational opportunities in the smaller private school than in the public system. This fact, together with the facts that the complete exclusion of religion from the public school leads to the establishment of sectarian schools, and that educational experimentation is commonly more easily conducted in the private school, will doubtless encourage the continuance of non-public secondary schools.

68. State systems of secondary education. In the United States there exists no Federal power or administrative machinery, such as is found in some countries, whereby the centralized control or supervision of secondary schools can be developed. Control over secondary education as over other forms of secondary education is left to the several States. Some States have exercised that power extensively: other States have left the control of secondary education almost entirely to local school authorities. As a result there is found little uniformity in practice, and gross inequalities in educational opportunity are obvious. It has already been shown that from the passage of the law of 1647 secondary schools in Massachusetts have been more or less controlled by the State. By the passage of the law of 1827 Massachusetts compelled the establishment of public high schools which were required to meet very specific demands as to curriculum, length of school year, etc., to that extent providing for a State system of secondary education. Not until 1902, however, did the State share directly in the support of public secondary education. An anomalous situation arose in the early part of the high-school movement when the State lent financial support to private academies, while requiring communities to maintain high schools, but not sharing in the support of them.

In other States comprehensive schemes for the State organization of all education, including the coördination of secondary schools with other divisions of education, were elaborated before the close of the eighteenth century or in the early part of the nineteenth century, although the actual carrying-out of proposed schemes failed or was developed later. Thus, in 1779 Jefferson presented a bill to the Legislature of Virginia which provided for elementary schools in each district in the State five or six miles square, for coördinated grammar schools at twenty centers in the State, and for the articulation of those schools with William and Mary College. Some of his proposals were incorporated in the law of 1796, but the scheme as a whole was not put into operation.

In 1784 the University of the State of New York was established and by 1787 it had assumed the fundamental characteristics of its present form. The University provided an elaborate form of control and supervision over all secondary schools and most of the higher institutions of the State. It did not originally provide for careful articulation between the elementary school and the academy, in part because of the then existing emphasis on secondary education, and in part because at that time much of the present-day elementary education was provided in the academy. Practically from the beginning assistance was rendered by the State to secondary education, and in 1813 a permanent "Literature Fund" was established which has always been applied wholly to the support of secondary education. The University plan was adopted in Georgia in 1785 in the Territory of New Orleans, in the University of Michigan in 1817, and the scheme may be traced in other States.

While the development of State systems of secondary schools began in the legal mandate of Massachusetts in 1647, its progress has been more favorable where State support has been stressed instead of legal mandate and where control and supervision has been gained in large part through the granting or withholding of public State funds. In some States there has never been any legal mandate requiring the establishment of public high schools and their development has been secured wholly or almost wholly by State aid encouraging local interest and support. Apparently the first example of a law providing for the appropriation of State funds to aid high schools (though the practice of granting aid through gifts of State money and land had grown up with the academy movement) was the act of the Legislature of Maine in 1871, which provided that the State should pay annually an amount equal to that raised by local taxation for a high school, that amount, however, not to exceed in any one case $500. A somewhat similar provision was made in Wisconsin in 1875, in Minnesota in 1878, and later in many other States. At the present time some form of State aid is provided in practically every Commonwealth, although the source of such funds, their amounts, and the forms of their distribution vary widely.[1] Especially noteworthy has been the tendency to encourage vocational education by the granting of State aid.

The fact that in most States legislation affecting the establishment and maintenance of public high schools during the earlier period was permissive rather than mandatory and the fact that in some States no provision had been made, gave rise early to the question of the legal right on the part of communities and States to raise and appropriate money derived from taxation for the support of high schools. The issue was finally settled in the affirmative by the Supreme Court of Michigan in the so-called Kalamazoo High School Case and that decision became the legal precedent.[2]

NOTE: Consideration of many special phases of the later development of secondary education is deferred. Such problems as the historical relation of the secondary school and the college, the historical relation between elementary and secondary education, the historical development of various studies, the historical development of the curriculum organization, and like topics are considered in appropriate later sections.

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[1] On the whole matter of State aid for secondary education see: Cubberley, E. P., *School Funds and Their Apportionment;* Snyder, E. R., *The Legal Status of Rural High Schools;* Hanger, J. H., "The Legal Status of the High School," chap. III of Johnston, C. H. (Editor), *The Modern High School.*

[2] 30 Michigan 69.

PROBLEMS FOR FURTHER CONSIDERATION

1. Trace the legal status of the secondary school in America.
2. Trace the development of local or State control of secondary education in America.
3. In what ways did the academy movement affect secondary education in America?
4. Trace the development of secondary school controlled or maintained by religious denominations in America during the past two decades. (Cf. *Reports of the United States Commissioner of Education* (1895–96 to 1916.)
5. Trace the development of non-academic subjects in the secondary-school curriculum.
6. Trace changes in the methods of teaching subjects in the secondary school as indicated by the textbooks employed. (Cf. Inglis, A. J., *The Rise of the High School in Massachusetts*, chap. VI.)
7. Trace the development of the academy in any one State.
8. Trace the development of the high school in any one State.
9. Trace the development of rural high schools in any one State.
10. Trace the development of State aid to secondary education in the United States.
11. Consider any one problem in present-day secondary education and trace its history.

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CHAPTER VI

SECONDARY EDUCATION IN OTHER COUNTRIES

69. The comparative study of secondary education. The comparative study of institutions for secondary education in different countries is one of the most effective means of evaluating theories and practices in any one country. To the student of secondary education in America some knowledge of the organization of secondary education in foreign countries is of value for a number of reasons.

(1) The person familiar with but a single type of institution tends constantly to think in terms of that institution only, fails to recognize the existence of many problems involved in that institution, and lacks a basis for intelligent comparison of institutions of different types designed to accomplish somewhat like and somewhat different purposes. A basis for the valuation of theories and practices in American secondary education is provided through the study of theories and practices obtaining in other countries.

(2) Dominant social ideals and the form of social organization differ in different countries, and the aims and organization of secondary education should vary accordingly. Nevertheless certain fundamental social ideals are much the same in all countries and in all cases secondary education has some common purposes. A study of the various ways in which secondary education is organized to achieve those common ends is suggestive of fundamental theories and practices for the student of secondary education in America or any other country.

(3) Many specific problems of theory and practice involved in secondary education in America at the present

time have in part originated in Europe. Instances may be found in connection with vocational education, continuation schools, methods of teaching foreign languages, economy of time in education, the earlier beginning of secondary education, etc. The development of many of these movements cannot be understood adequately without some knowledge of conditions affecting secondary education in certain European countries.

(4) From time to time proposals are made for the adoption in America of certain practices found in other countries. In some cases those proposals are worthy of serious consideration. In other cases foreign practice is itself misunderstood by those who advocate changes in America, or is so conditioned by factors peculiar to some one country that its adoption in America would be a gross mistake. The student of secondary education who is unacquainted with social and educational conditions in other important countries is at a disadvantage when called on to estimate the merits and defects of such proposals.

It is the purpose of this chapter to provide some basis for the comparative study of secondary education. Space available limits the number of secondary-school systems which can be considered and the amount of consideration which can be given to secondary education in any one country. Attention will be confined, therefore, to secondary education in Germany, France, and England — countries which are most suggestive to the student of secondary education in America.

70. Purview of secondary education in other countries. In different countries the organization of education is so varied that it is very difficult to make general statements concerning the institutions for secondary education. In many foreign countries two or more systems of education run somewhat parallel, separated by lines of social or

TABLE LXXXIII. STATISTICS OF SECONDARY SCHOOLS*

Countries	*Year of report*	*Types of secondary schools*	*Schools*	*Pupils*
Austria-Hungary	1910–11	Gymnasia and Realgymnasia	484	162,796
		Realschulen	189	62,500
		Gymnasia for girls (Austria only)	24	3,254
Total			697	228,550
Belgium	1912	Royal atheneums and colleges	35	8,323
		Middle-class schools, male	90	19,765
		Middle-class schools, female	44	10,104
		Middle-class normal schools	4	209
Total			173	38,401
Bulgaria	1911–12	Gymnasia	47	16,487
		Lower middle schools	316	55,512
		Special technical and other schools	155	9,492
Total			518	81,492
Denmark	1910–11	State schools	12	2,878
		Private Latin schools	39	9,860
		Private Realskole	126	17,815
Total			177	30,553
France	1913	Lycées for boys	112	62,879
		Communal colleges	231	37,324
		Secondary schools for girls	193	38,358
Total			536	138,561
Germany	1911	Gymnasia	524	160,237
		Realgymnasia	223	70,357
		Oberrealschulen	167	75,832
		Girls' Gymnasia	39	22,137
Total			953	328,563
Italy	1912–13	Ginnasi	553	49,784
		Licei	239	15,136
Total			792	64,920
Netherlands	1913–14	Gymnasia	33	2,817
		Middle-class schools	105	15,807
Total			138	18,624
Greece	1910–11	All secondary schools	338	31,399
Norway	1911–12	All secondary schools	89	19,716
Portugal	1913	All secondary schools	31	10,401
Russia	1912	Gymnasia	393	137,594
		Real schools	276	76,971
		Gymnasia for girls	779	292,353
Total			1448	506,918
Spain	1915	"Institutions"	59	33,071
Sweden	1914	Public high schools	77	24,364
Switzerland	1912	Schools leading to higher institutions	84	17,260
Japan	1913–14	Middle schools	316	131,242
		High schools for girls	328	82,474
Total			644	13,716

* *Report of the United States Commissioner of Education* (1916), vol. I, pp. 674–75.

economic cleavage. In few countries other than the United States, Canada, and Japan is secondary education sequentially related to elementary education. Nevertheless Table LXXXIII may serve as an introduction to the consideration of secondary education in other countries. The reader is warned that in no country can the character of secondary education and its scope be appraised accurately from the data given.

Secondary schools in the countries of Continental Europe are for the most part modeled on the type of the German Gymnasium and Realschule or on the type of the French lycée, so that the more extended consideration given to the schools of Prussia and of France in later sections will illustrate the general principles of organization and education in many other countries of Continental Europe. Secondary education in England is of a noticeably different character than that of Continental Europe and will be given separate attention.

I. SECONDARY EDUCATION IN PRUSSIA

71. The organization of school systems in Prussia. The German Empire comprises a number of more or less independent States (kingdoms, grand duchies, principalities, etc.), each of which controls its own system of education. In this respect the situation in Germany is somewhat the same as in the United States, where each State has entire control over its system of schools. However, since Prussia has about two thirds of the population of the German Empire, includes approximately two thirds of the total area, and has assumed a commanding lead in educational matters as well as in most political matters, the treatment of education in Germany given in the following sections will deal specifically with the Prussian schools as the type, with occasional references to differing conditions found in other States of the Empire.

Although there is no centralized system of educational control in the Empire as a whole, the administration is rather highly centralized in separate States. Thus, in Prussia the central authority is vested in the Minister of Religious and Educational Affairs who is responsible to the King alone. In the ministry under his charge are three departments, one for religious affairs and two for educational affairs — common schools and higher schools being controlled by different departments. In each of the twelve provinces which compose the Prussian Kingdom is a provincial school board having almost entire charge of all higher schools within the province. Through the department for higher schools in the State Ministry, through the provincial boards, and through the examining commissions, the centralized State control of higher schools is practically complete. The result is a system of standardized higher schools throughout the Kingdom of Prussia, manifesting a degree of uniformity in organization, administration, curricula, and all other matters, which is without parallel in any American State. Local school boards play an insignificant rôle in the control of higher schools. Municipalities may assume the initiative in the establishment of their own schools, but in such case they must conform to the regulations of the provincial boards. They may decide what type of school shall be established, but once established the school must conform in every way to the minimum requirements set. Local authorities may select their own teachers, but the selection must be made from a list of eligibles prepared by the higher authorities. In all cases the action of the local boards is determined by standards set up by higher authorities, and once the school is established little is left for the local authorities except to see that the work of the school fulfills the demands set by State and provincial officers and see that bills are paid. Their control over the professional side of the work of the school is nil.

72. The place of "higher schools" in Prussian education. In no State of the German Empire is there a division of elementary and secondary schools at all similar to that found in America. In Prussia there are really three almost entirely separate systems of schools: (*a*) schools for boys and girls of the common people, of which the basis is the "People's School" (*Volksschule*); (*b*) higher schools for boys of the upper classes (*Höhere Knabenschule*); (*c*) higher schools for girls of the upper classes (*Höhere Mädchenschule*). Boys and girls of the lower classes enter the *Volksschule* at the age of six and continue there until they are about fourteen, after which, if they continue their school education, they enter continuation or vocational schools, middle schools, etc. Boys of the upper classes enter the higher school proper at the age of nine or ten and continue there for a six-grade course or a nine-grade course. To most of the higher schools for boys are attached three-grade preparatory divisions (*Vorschule*) in which boys are trained from the age of six to the age of nine and then pass directly into the higher school proper. Theoretically there is articulation between the third grade of the *Volksschule* and the first grade of the higher school for boys. Practically there is almost no articulation between the systems. Girls of the upper classes enter the *Höhere Mädchenschule* at the age of six and remain there for twelve or more years according to the course chosen in the latter part of the school.

A more detailed description of the various higher schools will be given later. From this preliminary description, however, it should be clear that for different groups of pupils in Prussia elementary and secondary education (in the American sense of the terms) are combined in each of the three systems mentioned. No greater mistake could be made (and it is a common mistake) than to confuse the *Volksschule* (also called the *Elementarschule*) with the elementary school in the American sense of the term, and to confuse the *Höhere Schule* with the secondary school in the American sense.

73. Higher schools for boys in Prussia. Higher schools for boys in Prussia are of three types: (1) the *Gymnasium* and *Progymnasium*, which are essentially classical schools of the older type; (2) the *Realgymnasium* and *Realprogym-*

TABLE LXXXIV. PROGRAM OF STUDIES IN THE PRUSSIAN GYMNASIUM*

	VI	*V*	*IV*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*	*Total*
Religion	3	2	2	2	2	2	2	2	2	19
German[a]	4	3	3	2	2	3	3	3	3	26
Latin	8	8	8	8	8	7	7	7	7	68
Greek	...	...	...	6	6	6	6	6	6	36
French	...	...	4	2	2	3	3	3	3	20
History[a]	...	...	2	2	2	2	3	3	3	17
Geography	2	2	2	1	1	1	.	.	.	9
Mathematics	4	4	4	3	3	4	4	4	4	34
Natural science	2	2	2	2	2	2	2	2	2	18
Writing	2	2	...	...	...	...	...	...	...	4
Drawing[b]	...	2	2	2	2	...	...	...	...	8
Total	25	25	29	30	30	30	30	30	30	259
Gymnastics	3	3	3	3	3	3	3	3	3	27
Singing[c]	2	2	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(18)

NOTES: a. In the study of German for VI and V one hour per week is devoted to historical stories.
b. Drawing is optional two hours per week each in U II to O I.
c. After V singing is required of those possessing ability only.
Brackets denote that a redistribution of time is permissible.
Hebrew and English are optional for two hours per week in each of years O II to O I.

* *Lehrpläne und Lehraufgaben für die höheren Schulen in Preussen* (Berlin, 1901) pp. 5–7. The six-grade schools have exactly the same programs as those of the nine-grade schools from VI to U II.

nasium, which are in part classical and in part modern; (3) the *Oberrealschule* and *Realschule*, which emphasize modern studies. The *Gymnasium*, *Realgymnasium*, and *Oberrealschule* are nine-grade schools. The *Progymnasium*, *Realprogymnasium*, and *Realschule* are six-grade schools whose curricula correspond exactly to those of the respective nine-grade schools.[1] Boys completing the six-grade course, if they continue their education, enter the seventh grade of the corresponding nine-grade school.

Boys enter the preparatory department (*Vorschule*) of the higher school at the age of six and, after three years of study there, enter the higher school proper at the age of nine or ten. The complete higher school course has nine grades beginning with *Sexta* (the lowest, VI), and proceeding

TABLE LXXXV. PROGRAM OF STUDIES IN THE PRUSSIAN REALGYMNASIUM*

	VI	*V*	*IV*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*	*Total*
Religion	3	2	2	2	2	2	2	2	2	19
German[a]	4	3	3	3	3	3	3	3	3	28
Latin	8	8	7	5	5	4	4	4	4	49
French	...	...	5	4	4	4	4	4	4	29
English	...	...	...	3	3	3	3	3	3	18
History[a]	...	...	2	2	2	2	3	3	3	17
Geography	2	2	2	2	2	1	.	.	.	11
Mathematics	4	4	4	5	5	5	5	5	5	42
Natural science	2	2	2	2	2	4	5	5	5	29
Writing	2	2	...	...	...	...	...	...	...	4
Drawing	...	2	2	2	2	2	2	2	2	16
Total	25	25	29	30	30	30	31	31	31	262

NOTES: a. Music and gymnastics as in *Gymnasium*. Other notes as in *Gymnasium*, except that drawing (geometrical) is optional two hours per week from O III on.

* *Lehrpläne und Lehraufgaben für die höheren Schulen in Preussen* (Berlin, 1901), pp. 5–7.

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[1] Minor differences may be allowed in the *Realschule*.

through *Quinta* (V), *Quarta* (IV), *Unter-tertia* (U III), *Ober-tertia* (O III), *Unter-sekunda* (U II), *Ober-sekunda* (O II), *Unter-prima* (U I), and *Ober-prima* (O I). Thus the close of the six-grade school or course comes at the end of *Unter-sekunda.*

The character of the different types of higher schools for boys may be seen best from the programs presented in Tables LXXXIV, LXXXV, and LXXXVI. The headings refer to the classes or grades mentioned and the figures refer to the number of periods per week devoted to the various studies.

TABLE LXXXVI. PROGRAM OF STUDIES IN THE PRUSSIAN OBERREALSCHULE*

	VI	*V*	*IV*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*	*Total*
Religion	3	2	2	2	2	2	2	2	2	19
German[a]	5	4	4	3	3	3	4	4	4	34
French	6	6	6	6	6	5	4	4	4	47
English	...	...	...	5	4	4	4	4	4	25
History[a]	...	...	3	2	2	2	3	3	3	18
Geography	2	2	2	2	2	1	1	1	1	14
Mathematics	5	5	6	6	5	5	5	5	5	47
Natural science	2	2	2	2	4	6	6	6	6	36
Writing	2	2	2	...	...	...	...	...	...	6
Freehand drawing	...	2	2	2	2	2	2	2	2	16
Total	25	25	29	30	30	30	31	31	31	262

NOTES: Same as for the *Realgymnasium.*

* *Lehrpläne und Lehraufgaben für die höheren Schulen in Preussen* (Berlin, 1901), pp. 5–7.

A tabulation of the total number of periods per week devoted to the various studies shows the difference between the three types of schools.

TABLE LXXXVII

	Gymnasium	*Realgymnasium*	*Oberrealschule*
Religion	19	19	19
German	26	28	34
Latin	63	49	...
Greek	36	...	...
French	20	29	47
English	... (+ 6)	18	25
History	17	17	18
Geography	9	11	14
Mathematics	34	42	47
Natural science	18	29	36
Writing	4	4	6
Drawing	8 (+ 9)	16 (+ 10)	16 (+ 10)
Totals	259	262	262

The *Gymnasium* of to-day is the lineal descendant of the old classical *Gymnasium* established before the Reformation. To it attaches all the prestige and support which comes from reverence for an old-established institution, and, since it receives the support of the military and aristocratic classes, it is preëminently the socially "select" higher school for boys in Germany. It has been mentioned in the preceding chapter that the movement away from the narrow classicism of the sixteenth and seventeenth centuries was marked in Germany in the middle of the eighteenth century by the beginning of "real" schools (*Realschulen*). Their early promise was soon checked, however, and in spite of attempts at reform during the early part of the nineteenth century it was not until the ministerial order of 1859 that the modern movement for the newer types of schools was officially recognized by the institution of the *Realschule Erste Ordnung* and the *Realschule Zweite Ordnung*. The first of these schools was permitted to offer a full nine-grade course and later developed into the *Realgymnasium*. The second of those schools was a six-grade school. The *Oberrealschule* was created by adding three grades to that six-grade *Realschule* in 1882. After the establishment of the *Oberrealschule* the *Realgymnasium* in the opinion of many became a rather useless institution and in the Conference of 1890 its discontinuance was recommended by a majority vote. The recommendation was not carried out, however, and the *Realgymnasium* continues to exist as a higher school occupying a position midway between the *Gymnasium* and the *Oberrealschule*. In 1870 for the first time those who had passed the "leaving examination" (*Abiturientenprüfung*) of the *Realschule Erste Ordnung* (later the *Realgymnasium*) were given access to the university, though to certain courses only. This privilege was extended to the students of the *Oberrealschule* in 1892 but it was not until the imperial edict of 1900 that limitations were removed and the three types of higher schools placed on practically an equal footing in Prussia.

74. **"Reform Schools" in Germany.** The limited articulation between the three types of higher schools for boys in Prussia and the consequent necessity for early decision as to the school or course to be pursued by any boy has led within recent years to attempts to modify existing institutions. As a result there have developed *Reformgymnasien* which have introduced two new principles: (*a*) the principle of a common foundation in the lower grades; (*b*) the principle of bifurcation in the upper grades. This means that the decision of an educational choice may be postponed for some years and that two or more courses may be offered in one institution.

Two general types of *Reformgymnasien* are found — the Frankfurt system and the Altona system. Of these the Frankfurt system provides a common foundation in the earlier grades for gymasial and realgymnasial courses, and the Altona system provides a common foundation for realgymnasial and realschule courses. The reforms inaugurated by these two systems are so important that they deserve some detailed consideration. The official program for the Frankfurt system is as follows:

Table LXXXVIII. The Frankfurt Program *

Subjects	*Lower Division*			*Middle Division*		*Upper Division*							
						Gymnasium				*Realgymnasium*			
	VI	*V*	*IV*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*	*U II*	*O II*	*U I*	*O I*
Religion	3	2	2	2	2	2	2	2	2	2	2	2	2
German	5	4	4	3	3	3	3	3	3	3	3	3	3
French	6	6	6	G2 R4	G2 R4	2	2	2	2	3	3	3	3
Latin	...	...	...	G10 R 8	G10 R 8	8	8	8	8	6	6	6	6
Greek	...	...	...	...	...	8	8	8	8	...	...	...	...
English	...	...	...	...	...	...	...	...	...	6	4	4	4
Geography	2	2	2	1	1	...	...	...	1	1	1	1	1
History	...	...	3	2	2	2	2	3	2	2	2	2	2
Mathematics	5	5	5	4	4	3	4	4	3	4	5	5	5
Nature study	2	2	2	2	2	...	...	...	...	...	...	...	...
Writing	2	2	...	...	...	...	...	...	...	...	...	...	...
Drawing	...	2	2	2	2	...	...	...	...	2	2	2	2
Physics	...	...	...	...	...	2	2	2	2	3	2	2	2
Chemistry	...	...	...	...	...	...	...	...	...	...	2	2	2

* *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 8. G = *Gymnasium.* R = *Realgymnasium.*

It is to be noted here that all pupils take the same course in the first three grades and that the work in grades *Untertertia* and *Obertertia* differs only in the distribution of time between Latin and French. Thus differentiation is practically postponed until the boy is the age of about fourteen.

This type of school has become popular in Prussia, 133 having been established in that state by 1912.[1]

TABLE LXXXIX. THE ALTONA PROGRAM *

Subjects	*Foundation*			*Realschule*			*Realgymnasium*					
	VI	*V*	*IV*	*III*	*II*	*I*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*
Religion	3	2	2	2	2	2	2	2	2	2	2	2
German	4	3	3	3	3	3	2	2	3	3	3	3
French	6	6	5	6	6	5	4	4	4	4	4	4
English	...	...	4	5	4	5	3	3	3	3	3	3
Latin	...	...	...	...	...	...	6	6	5	5	5	5
History and Geography	3	3	4	4	4	3	4	3	3	3	3	3
Mathematics	5	5	6	6	5	5	5	4	5	4	5	5
Nature study	2	2	2	2	2	...	2	2	2	...	...	...
Writing	2	2	...	...	...	...	...	...	...	...	...	...
Drawing	...	2	2	2	2	2	2	2	2	2	2	2
Physics	...	...	...	...	2	3	...	2	2	3	2	2
Chemistry	...	...	...	...	...	2	...	...	...	2	2	2

* *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 8.

The Altona system has not proved very popular, there being but five in Prussia in 1912, some of which have changed to the Frankfurt plan since then.

According to figures presented in the *Kommunales Jahrbuch* for 1913–14 there were 184 *Reformschulen* in Germany in 1912, Prussia having 133.[2] In spite of the rapid development of such schools, however, the older types of separated schools are dominant. How far they may be able to withstand the encroachment of the *Reformschulen* must remain for the future to determine.

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[1] *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 9.

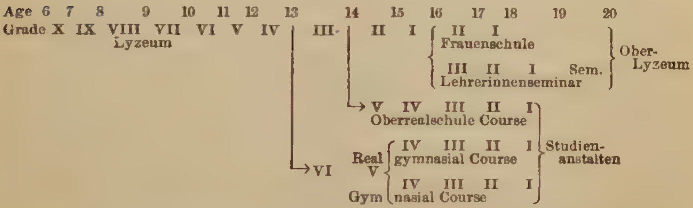
[2] *Kommunales Jahrbuch* (1913–14), p. 362. Cf. *Statistisches Jahrbuch* (1913–14), pp. 1012, 9–10.

75. Higher schools for girls in Prussia. In considering the higher schools for girls in Prussia two important facts must be kept in mind. The first is that higher education for girls is a matter of recent development, its present organization beginning with the regulations of 1908. Hence higher education for girls in Prussia must be considered to be in a formative and experimental stage. The second fact is that higher education for girls is separate from that for boys and different in organization. Coeducation is practically unknown in Prussia.

The central institution for the higher education of girls is the *Lyzeum*, which offers education, elementary and secondary in the American sense of the terms, for girls from the age of six to the age of sixteen. Superimposed on this course is the *Oberlyzeum* which comprises two courses, one the Women's School (*Frauenschule*) with a two-grade course, designed to provide training in household and kindergarten arts, the other the Teachers' Training School (*Höheres Lehrerinnenseminar*) with a four-grade course, designed to train teachers for the lower schools. In addition, for girls who plan to enter the university, there are higher-course schools (*Studienanstalten*) which are essentially university preparatory schools. These correspond somewhat to the courses for boys in the *Gymnasium*, *Realgymnasium*, and *Oberrealschule* and are called by corresponding names. Girls taking the *Oberrealschule* course are transferred from the *Lyzeum* at the close of the eighth grade (minimum age fourteen years). Girls taking the *Gymnasial* or *Realgymnasial* course are transferred from the *Lyzeum* at the close of the seventh grade (minimum age thirteen years). Thus the *Gymnasial* and *Realgymnasial* courses for girls have six grades and the *Oberrealschule* course has five grades, all having a common basis in the *Lyzeum*.

The general organization of higher schools for girls may be seen from the following diagram and the program for the *Lyzeum.*

TABLE XC. THE ORGANIZATION OF HIGHER SCHOOLS FOR GIRLS IN PRUSSIA *



* Adapted from *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 7.

In the *Frauenschule* the course of study comprises pedagogy (two hours per week in each of the two grades), household arts, including practical work (five periods per week in each grade), kindergarten teaching, including practice work (four periods per week in each grade), hygiene and the care of children, including practical work in nurseries, etc. (four periods per week in each grade), civics and economics, including visits to institutions (two periods per week in each grade), household bookkeeping (one period per week in each grade), needlework (two periods per week in each grade), and religion, German, French, English, Latin, Italian, history, geography, science, history of art, gymnastics, drawing and painting, music (each subject according to circumstances and needs; two periods each per week).

In the *Höheres Lehrerinnenseminar* the course of study includes three years of academic continuation work and one year of practical work. The studies of the three first years comprise religion, German, French, English, history, geography, mathematics, natural science, pedagogy, method

TABLE XCI. COURSE OF STUDY IN THE PRUSSIAN LYZEUM *

a. Literary and Scientific Subjects

	Lower stage			*Middle stage*			*Upper stage*				*Total*
	X	*IX*	*VIII*	*VII*	*VI*	*V*	*IV*	*III*	*II*	*I*	*VII–I*
Religion	3	3	3	3	3	3	2	2	2	2	17
German	10	9	8	6	5	5	4	4	4	4	32
French	...	...	...	6	5	5	4	4	4	4	32
English	...	...	...	...	...	...	4	4	4	4	16
History[a]	...	...	...	...	2	2	2	2	2	3	13
Geography	...	...	2	2	2	2	2	2	2	2	14
Mathematics	3	3	3	3	3	3	3	3	3	3	21
Natural Science	...	...	...	2	2	2	3	3	3	3	17
Totals	16	15	16	22	22	22	22	24	24	24	162

b. Technical Subjects

	X	*IX*	*VIII*	*VII*	*VI*	*V*	*IV*	*III*	*II*	*I*	*VII–I*
Writing	...	3	2	1	1	1	...	...	...	...	3
Drawing	(b)	(b)	(b)	2	2	2	2	2	2	2	14
Needlework	.	2	2	2	2	2	(c)	(c)	(c)	(c)	6 (14)
Singing	1	1	1	2	2	2	2	2	2	2	14
Gymnastics	1	1	1	2	2	2	3	3	3	3	18
Totals	2	7	6	9	9	9	7 (9)	7 (9)	7 (9)	7 (9)	55 (63)

NOTES: a. Including art history.
b. In classes X–VIII occasional drawing and clay modeling during the object lessons in German.
c. Needlework is optional in the upper classes.

* From Monroe, P., *Cyclopedia of Education*, vol. III, pp. 86–87.

and model lessons, drawing, singing, gymnastics. The work of the practical year comprises method and model lessons, practice teaching, reports, and discussions.

In the *Studienanstalten* the courses of study correspond in general to the courses of study in the boys' higher schools though the entire course, including the *Lyzeum* grades, covers thirteen years instead of twelve and the number of recitations per week is somewhat smaller. Few higher girls' schools maintain *Studienanstalten*, however, and many girls find it practically impossible to secure the kind of education provided in such institutions. Since that is the only avenue of approach, they are unable to prepare themselves for work in the university.

76. Statistics of higher schools in Germany. In 1912 there were 1395 higher schools for boys in Germany, distributed as follows:

TABLE XCII. DISTRIBUTION OF HIGHER SCHOOLS FOR BOYS IN GERMANY IN 1912 *

States	*Gymnasien*	*Realgymnasien*	*Oberrealschulen*	*Progymnasien*	*Realprogymnasien*	*Realschulen*	*Totals*
Prussia	339	143	97	30	57	167	833
Bavaria	48	5	9	31	...	48	141
Saxony	19	21	5	...	5	33	83
Württemberg	18	7	12	6	...	20	63
Baden	18	9	11	...	2	25	65
Other States	83	29	29	3	4	62	210
Totals	525	214	163	70	68	355	1395

* *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 5.

From these figures it is evident that the *Gymnasium* with its classical curriculum is still the most prominent of the higher schools for boys.

In Prussia the boys in attendance at the higher schools were distributed, as shown in Table XCIII, in 1912.

In 1909 the distribution of boys according to grade was as shown in Table XCIV.

About one half of the boys who enter *Sexta* of the *Gymnasium* or *Progymnasium* apparently continue into *Ober-*

TABLE XCIII. DISTRIBUTION OF BOYS IN HIGHER SCHOOLS IN PRUSSIA IN 1912 *

Gymnasien	103,314	Progymnasien	3,787	Both	107,101
Realgymnasien	50,319	Realprogymnasien	4,346	Both	54,665
Oberrealschulen	41,986	Realschulen	32,421	Both	74,407
Nine-grade schools	195,619	Six-grade schools	40,554	Total	235,173

* *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 1012, 5.

TABLE XCIV. †

Grade	*VI*	*V*	*IV*	*U III*	*O III*	*U II*	*O II*	*U I*	*O I*	*Total*
Number	36,949	34,697	34,492	31,184	27,619	23,775	13,616	10,222	8,304	220,959

† Cf. Monroe, P., *Cyclopedia of Education*, vol. III, p. 84.

TABLE XCV. STATISTICS OF HIGHER SCHOOLS IN GERMANY IN 1911 ‡

	Schools		*Teachers*		*Pupils*	
	Public	*Private*	*Public*	*Private*	*Public*	*Private*
Schools having a nine-year course	914	15	16,950	221	306,426	2,905
Gymnasien	524	6	9,769	157	160,237	2,451
Realgymnasien	223	3	3,708	31	70,357	304
Oberrealschulen	167	4	3,473	33	75,832	150
Schools having a six-year course only	1,186	124	7,230	975	170,908	16,562
Progymnasien	81	7	570	36	9,509	1,095
Realprogymnasien	63	1	384	3	7,252	32
Realschulen, Bürgerschulen, etc.	629	103	5,037	903	104,457	14,989
(Vorschulen)	413	13	1,239	33	49,690	466
Higher schools for girls	828	373	12,398	4,599	234,461	79,679
Gymnasien	39	5	1,039	64	22,137	1,399
Higher schools	789	368	11,359	4,535	212,324	78,280
Grand totals	2,928	512	36,578	5,795	711,795	99,146

‡ Figures quoted from *Report of the United States Commissioner of Education* (1913), vol. I, p. 822.

sekunda and about one third continue into *Oberprima.* Of boys who enter *Sexta* of the *Realgymnasium* or *Realprogymnasium* about one third continue into *Obersekunda* and about one sixth into *Oberprima.* Of boys who enter *Sexta* of the *Oberrealschule* or *Realschule* about one sixth continue into *Obersekunda* and a little over one sixteenth continue into *Oberprima.* Of all boys entering *Sexta* of a higher school a little over one third persist as far as *Obersekunda* and between one quarter and one fifth continue into *Oberprima.*

Table XCV presents figures for all higher schools in Germany in 1911.

77. **"Intermediate schools," etc., in Germany.** As it is a great mistake to consider all the work of the "higher schools" of Germany as involving secondary education in the American sense of that term, so it is a great mistake to consider that all secondary education in Germany is confined to the higher schools above considered. In reality elementary education in the American sense of the term must be conceived as cutting a cross-section through the lower grades of all the higher schools previously considered and the *Volksschule.* Likewise secondary education in the American sense of the term must be conceived as cutting a cross-section through the upper grades of the higher schools above considered and also through a number of other schools, including the Intermediate Schools (*Mittelschulen*), "Citizens' Schools" (*Bürgerschulen*, which are closely allied to the *Realschulen*), certain vocational schools (including agricultural schools, *Lantwirtschaftsschulen*, higher trade schools, etc.), continuation schools (*Fortbildungsschulen*), etc. What proportion of the work in these last-mentioned schools should be considered of secondary grade in the American sense of the term it is impossible to determine. Nevertheless the fact should not be overlooked that much of the work peculiar to secondary education in America is

provided for in schools other than the higher schools commonly classed under the head of "secondary schools" in Germany. Vocational education, for instance, is not provided for at all in the *Gymnasium*, *Realgymnasium*, *Oberrealschule*, etc., but is relegated to special vocational schools.

In Prussia, previous to the regulations of February 3, 1910, the intermediate school (*Mittelschule*) had been developed less extensively than in other States of the Empire. Since the promulgation of those regulations, however, the *Mittelschule* has given promise of extensive development in Prussia and may in the future prove an important step in the articulation of the *Volksschule* system and the higher schools system. They comprise a nine-grade course which in the lower stages have a common course with the *Volksschule* and in the higher grades may be articulated with the higher schools. The course includes the following studies: religion, German, Latin, French, English, history, geography, mathematics, nature study, and other common subjects.[1]

The importance of continuation schools in Germany may be seen from the figures presented in the following table.

TABLE XCVI. CONTINUATION SCHOOLS IN GERMANY IN 1911 *

	Schools	*Pupils*
Industrial continuation schools	3,300	550,000
Commercial continuation schools	700	102,000
Agricultural continuation schools	5,200	84,000
Non-vocational continuation schools	16,000	700,000
Total listed	25,200	1,436,000

* Cf. *Report of the United States Commissioner of Education* (1913), vol. II, p. 818. The figures are in round numbers.

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[1] Cf. Monroe, P., *Cyclopedia, of Education*, vol. III, p. 78; *Statistisches Jahrbuch der höheren Schulen* (1913–14), p. 2280 *ff.*; *Kommunales Jahrbuch* (1913–14), p. 360.

The organization of other vocational schools in the German States is too complicated to permit analysis here. It should be recognized, however, that they play an important part in the educational systems of the Empire of great importance to the student of secondary education.

78. Teachers in Prussian higher schools for boys. All teachers in the public higher schools of Prussia are State employees who have been certificated by the State authorities. In order to secure such positions they must have shown their qualifications: (*a*) by presenting a leaving certificate from a *Gymnasium*, *Realgymnasium*, or *Oberrealschule;* (*b*) by presenting evidence that they have spent at least six semesters at a recognized university; (*c*) by passing examinations in philosophy (including psychology), pedagogy, German literature, religion, and in the special subjects to be taught (at least two subjects must be included); (*d*) by spending a *Seminarjahr* (year in practice and observation); (*e*) by spending a *Probejahr* (trial year). Having met these requirements successfully, the candidate is then qualified for appointment and receives the title *Oberlehrer*. Older teachers may receive the title *Professor*. The salary of the *Oberlehrer* begins at 2700 marks ($675) and by triennial increases of 700 marks ($175) reaches 4800 marks ($1200) after nine years of service. From that point the triennial increases of 600 marks ($150) bring it up to 7200 marks ($1800) after twenty-one years of service. To this must be added from 560 to 1300 marks ($140–$325) allowed as compensation for rent. These figures apply to the salaries of the ordinary teachers in boys' higher schools. Salaries of headmasters are not much higher than those of the higher teachers. In the higher schools for boys men teachers only are engaged. In the higher schools for girls both men and women teachers are employed, the latter having been prepared either at the universities or in the higher normal school (*Höheres Lehrerinnenseminar*).

The training of the higher-school teacher is thorough and adequate. His selection and certification are carefully supervised. From those two facts result the high character of the teachers employed and the excellent teaching found. In spite of what appears to Americans to be a relatively low salary schedule, an abundance of excellent material is recruited. This arises in large part from the fact that the higher-school teacher in Germany is recognized as a professional official of the Government with a social and official position on a par with other higher professions.

79. **Higher schools and the social organization.** The schools of Germany are intimately and functionally related to the social structure to an extent not apparent in most countries. As evidence of this in Prussia we may note first the well-organized and standardized work of the schools under rather high centralization of control and administration, typical of the efficient organization of social and economic institutions in the State. Secondly, we may note the lines of social distinction manifest in the social organization of the Prussian State and exemplified in the separation of the *Volksschule* and the higher schools.[1] Thirdly, we may note the powerful influence of the aristocratic and military classes in their struggle to maintain the supremacy of the aristocratic *Gymnasium* throughout the nineteenth century and the present status of that school. In the fourth place, we may note the characteristic German attitude toward women manifest in the failure until recently to provide higher education for girls. In the fifth place, we may

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[1] As this book goes to press, there is evident in German pedagogical journals renewed agitation for the reorganization of German schools so as to establish an *Einheitschule* providing a common educational foundation for all pupils up to the age of twelve. Cf. Kandel, I., *School and Society*, vol. v, p. 3.

note the specific points of social organization in connection with the relation of the schools to the social and industrial phases of German life. These are manifest best, perhaps, in the various social, military, professional, and educational privileges granted to boys who have successfully completed specified parts or all the work of the higher schools.

Boys who successfully complete the work of the first six grades of a higher school receive a certificate which entitles them to serve but one year in the army instead of two or more required of others. Also such boys have the privilege within limits of choosing the time of their military service, the regiment in which they may serve, and other privileges of a military nature. In addition, since that certificate indicates a recognized standard of training, it is an indispensable requirement for many minor Governnent positions, and in many respects it functions much as a part of a civil service system. Hence also many mercantile houses require the possession of such a certificate of all their apprentices in many lines. Thus the acquirement of this certificate establishes a well-determined point of demarcation in the higher-school system at the close of the sixth grade, noticeable not only in the organization of the six-grade schools, but also in the falling off of pupils at that point in the nine-grade schools.[1]

At the end of the nine-year course comes the "maturity" examination (*Reifeprüfung*). The passing of that examination gives the boy the right of admission to the university or higher technical school, and a higher social recognition than he can otherwise secure. Since practically the only avenue to the higher professions lies through the university, it cannot be entered save by first completing the course of study in a higher school.[2]

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[1] Table XCIV.

[2] For details of the privileges granted to boys completing various amounts of work in the higher schools of Germany see *Statistisches Jahrbuch der höheren Schulen* (1913–14). Cf. also Russell, J. E., *German Higher Schools*, Appendices.

Such privileges offer to the German boy and his parents an appeal that can scarcely be appreciated by the American. The ambitious parent struggles hard to give his son the benefits of an education in the higher school, although the financial burden of tuition alone is not always light. Contrary to the American practice, but quite in accord with European practice, higher-school education is not free in Germany and tuition is regularly charged, the maximum in Prussia being 150 marks ($37.50) per annum.

80. Secondary education in Germany and America. Though the limits of space have permitted only a general outline of secondary education in Germany, sufficient data have been presented to indicate a number of important differences between secondary education in Prussia and in the United States. Some of the more important differences may be summarized here, though the reader should be warned that fundamental differences in organization make difficult comparisons which are frequently made.

(1) Attention has already been called to the fact that "elementary education" and "secondary education" are not delimited in Germany as in America by administrative divisions. Elementary education in the American sense of the term is provided in each of the three systems of education previously outlined. Secondary education in the American sense of the term is provided especially in the two systems of boys' and girls' higher schools, but also to some extent in the intermediate schools and in vocational schools which are more directly correlated with the *Volksschule.* To gain a purview of elementary education one must, therefore, examine a cross-section through all three systems of schools, and to gain a purview of secondary education one must examine the higher grades of the three systems. In either case it is quite impossible to designate a specific grade as the beginning of secondary education, which must

be conceived as developing gradually out of the lower stages of education and without any line of clear demarcation. One of the most noteworthy features of the German school systems is the fact that whatever school system a boy or girl enters he proceeds gradually and without abrupt transition from stage to stage.

(2) Notwithstanding the above-mentioned facts it is true that "secondary education" begins at an earlier age and that differentiated education begins much earlier in Germany than in America. Here we may, in some respects at least, agree with a German critic: "Admittedly, the secondary school in north Germany begins too early, when it starts at nine years of age; but just as surely does the American secondary school begin too late." [1] This problem will be considered in a later section.

(3) Lines of social and economic cleavage are much more manifest and important in the schools of Germany than in the United States. This is clear from the separation, even in the earlier stages, of children in the *Volksschule* and the *Höhere Schulen*, in the fact that no form of vocational education is provided in the higher schools for boys, and in the fact that a relatively small number of boys and girls are enrolled in the higher schools. Confessedly, the German higher schools are designed not for people in general, but for special groups. Selection, a legitimate function of secondary education, becomes in German higher schools selection by elimination or exclusion, whereas in America it becomes selection by differentiation of courses and studies to meet the needs of individual differences. Because of differences in organization exact comparison between the "higher schools" of Prussia and the public high schools of the United States becomes difficult, if not impossible.

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[1] Kerschensteiner, G., *A Comparison of Public Education in Germany and in the United States*, Bureau of Education Bulletin (1913), no. 24, p. 13.

Considering higher schools for boys alone in Prussia and the public high schools in the United States, we may note the following figures:

Table XCVII. Number of Boys per 100,000 of Total Population in the Höhere Schulen of Prussia and in the Public High Schools of the United States in 1909 *

Theoretic age		*14–15*	*15–16*	*16–17*	*17–18*	*Total*
American high schools....	Grade.......	I	II	III	IV	I–IV
	Number.....	194	116	74	47	422
Prussian "higher schools".	Grade.......	U II	O II	U I	O I	U II O I...
	Number.....	59	34	26	22	115

* Compiled by the writer from data in Table XCIV and in *Report of the United States Commissioner of Education* (1910), vol. II.

(4) Fixity of curriculum is the rule in German schools and flexibility is the rule in the American high school. In Germany the pupil chooses his school, in America he chooses his course or even his specific studies. In Germany, after a decision has been made as to the type of school to be attended, there is practically little opportunity for transfer to another type of school. This rigidity is all the greater because there is little opportunity for choice of studies within any higher school and the curriculum is the same for all. The contrast is noticeable with the elective system found in America. It is possible that the elective system has been carried too far in this country, but it would appear to the American educator that it has not been carried far enough in Prussia. The development of the *Reformgymnasien* in Germany indicates a strong tendency to modify the school system so as to postpone to a later age and grade the decision of the curriculum to be engaged in by the pupil in the higher school.

(5) While secondary education in America may, perhaps, be considered more extensive than secondary education in Prussia in point of the number of individuals that it reaches and in point of the differentiated scope of its offerings, it

must also be noted that secondary education in Prussia (at least in the *Höhere Schulen*) is more intensive in the sense that it is more thorough and systematic. Perhaps the advantages and disadvantages in either case are necessarily correlated. The period of formal education covered from the beginning of school life in both countries is approximately the same, from age six to age eighteen. The results, however, appear to be far different. The graduate of the German higher school is commonly considered to be as far advanced in his education as boys in the sophomore class of the American college. This is certainly true of much of his attainment in subject-matter, and with respect to the character of his development along academic lines. Doubtless the reason for much of this is found in the fact that in Germany there is a longer school day, a longer school week, and a longer school year. However, it is also in part doubtless due to the efficiency of instruction. Critics of German and American school systems frequently note the lack of thoroughness and the superficiality in American secondary education in comparison with the "hard fiber of intellectual discipline" of the German higher school. Likewise they note the greater freedom of the American secondary school, the individuality, initiative, and adaptability engendered by it (or by the general social stimulus?), in contrast with the rigidity and uniformity of the German higher school.[1] The contrast should not be considered without reference to the conception of the intensive, selective aim of the German higher school and the extensive aim of the American high school. A proper comparison would be between the best fourth of the American secondary-school pupils and the average pupil in the German higher school.[2] It must further be noted that the last years of the German higher school take the place of a part of our college course, which is itself essentially secondary in character. In this connection attention may be called to the fact that, while the theoretic age of graduation from the German higher school for boys is eighteen, the median age is eighteen years and seven months. Figures for candidates taking the leaving examination of the higher schools of Prussia in 1908 indicate that more candidates were twenty years of age or older than were eighteen years of age or younger, and that the largest age group was that of the nineteen year olds.[1]

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[1] Kerschensteiner, G., *op. cit.*, p. 14.

[2] Cf. Table XCVII.

(6) In the secondary education of girls is found one of the most noticeable differences between the secondary schools of Germany and those of the United States. Attention has already been called to the fact that in Prussia public higher schools for girls is a matter of development within the past decade. Again exact comparison in figures is out of the question because of differences in organization, but we may note that in all the higher schools for girls in Germany in 1911 there were 234,461 girls distributed over twelve or thirteen grades, while in the public high schools alone of the United States in 1910 there were 551,624 girls, distributed over four grades. Attention has also been called to the fact that coeducation is all but unknown in Germany.

(7) Probably one of the greatest factors contributing to the character of the German higher school is found in the character of the teacher, who, on the average, is far superior to the American high-school teacher. This is due to a number of factors — the superior character of the material available (due in part to the prestige of the teaching profession in Germany), the high standards set, the training which the prospective teacher receives, and the high professional spirit manifest. These standards and conditions are not paralleled in America. In this connection, however, it is well to note some circumstances sometimes overlooked.

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[1] Monroe, P., *Cyclopedia of Education*, vol. III, p. 85.

The most important of these is the fact that the unparalleled development of secondary education in America and the great increase in the number of secondary-school pupils during the past quarter-century created a demand for secondary-school teachers which far exceeded the available supply of well-prepared men and women. With the high school now well established and conditions somewhat settled, with better facilities provided for training secondary-school teachers, and with the establishment of standards which are now being formulated, the secondary-school teacher of America should in the near future assume a more favorable position for comparison with his German colleague.

(8) Back of all the various points of difference in the American and German school systems lie fundamental differences in social ideals which must always be kept in mind when comparing the two systems or when examining either. In both cases the character of secondary education is determined fundamentally by social ideals which are buried deep in the lives and customs of the two peoples. The efficiency of either system must be interpreted in terms of the dominant social ideals and the form of social organization which determine the character of the State itself.

II. Secondary Education in France

81. The system of education in France. Of all important countries France possesses the most highly centralized form of educational control and administration. In that country the entire system of public education is under the charge of the Minister of Public Instruction and Fine Arts and his subordinate officials or bureaus. By them the final control and administration of the schools is determined, the programs of study organized, the schools inspected, the qualifications of teachers prescribed, and the examination of pupils controlled. Little is left for local participation in the affairs of education except a certain amount of initiative in establishing schools, the administration of certain routine matters, and the payment of funds in support of the schools. The local community may decide whether or not a school is wanted in some cases. They may provide for the construction, equipment, and maintenance of a school, but once such a school is established its control and administration passes out of their hands into the hands of the Ministry of Public Instruction and Fine Arts.

France, like Prussia, maintains three separate systems of schools: (*a*) schools for boys and girls of the common people, of which the basis is the "primary school" (*école primaire*); (*b*) "secondary schools" for boys (*lycée de garçons* and *collège de garçons*); (*c*) "secondary schools" for girls (*lycée de jeunes filles*, *collège de jeunes filles*, and *cours secondaire de jeunes filles*). Boys and girls of the common people enter the "primary school" proper at the age of five or six (many have previously attended the *école maternelle*), where they remain in the *école primaire élémentaire* up to the age of about thirteen or in the *école primaire supérieure* up to the age of about fifteen. Some enter the *école practique* (vocational school). Boys of higher social or economic standing enter the "secondary school" (*lycée* or *collège*) proper at about the age of ten and remain there (for the full course) up to the age of about seventeen. To the "secondary school" proper, however, there is attached a preparatory division (*division préparatoire*) for boys of ages six to seven, and an elementary division (*division élémentaire*) for boys of ages eight to nine. In some cases an "infant class" precedes the preparatory division. As a matter of fact the French "secondary school" for boys is an institution complete in itself, being neither dependent on the "primary school" for its supply of pupils nor leaving education other than professional for later study in college or university. Theoretically pupils may pass from the "primary school" to the *lycée* or *collège* and "secondary education is coördinated with primary education in such a way as to follow a course of primary studies normally four years in length."[1] Practically there is no such articulation between the two systems and few "primary-school" pupils, except those receiving Government scholarships through competitive examinations, pass from the *école primaire* to the *école secondaire*. The selection of the school which a boy may enter in France is determined almost entirely by social and economic factors.

Girls of the higher social and economic classes enter the "secondary school" proper (*lycée*, *collège*, or *cours secondaire*) at the age of about twelve. They enter the "primary classes" of that school, however, at the age of nine, and the "infant class" which precedes it at the age of eight. They remain in the "secondary school" (for the full course) up to the age of about seventeen or eighteen.

From this limited preliminary description of the three school systems of France it is apparent that, as in the case of the Prussian systems, the so-called "secondary schools" must be considered to include both elementary and secondary education in the American sense of those terms and that the "primary school" of France is not to be considered as corresponding completely to the "elementary school" of America. In this connection it is interesting to note that a plan for a unified national school system was presented before the Chamber of Deputies in a bill introduced in 1913:

> The professed intention of the bill is to establish equality of opportunity for all children. For this purpose its author would put an end to the dualism of the existing system which provides

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[1] Decret du 31 Mai, 1912. Cf. *Plan d'Études et Programmes de l'Enseignement Secondaire des Garçons* (11th edition), p. 1.

> for one kind of school for the masses and another for those favored of fortune, and substitute "the national school," organized in three cycles. In the plan outlined by M. Buisson, the first cycle is devoted to elementary primary education to be given uniformly to all children five to eleven years of age; the second cycle is for children from eleven to fourteen years of age; in this cycle the education will be varied according to the requirements or aptitudes of the pupils, but in spite of these pedagogic differences perfect social equality will be maintained; in the third cycle education will be distinctly vocational (*professionelle*), the term being used in the widest sense.[1]

Whatever may be the likelihood that education in France will be developed along these lines in the near future, it is nevertheless true that the intent of the bill represents the attitude of many people in France toward the existing tripartite system of schools, with distinctions based largely on social and economic considerations.

82. Types of "secondary schools" for boys in France. The system of "secondary education" for boys in France at the present time is that inaugurated by the regulations of May 31, 1902, as modified by the regulations of November 15, 1912, which went into effect in October, 1913. According to those regulations, two types of "secondary schools" are recognized, the *lycée* and the *collège*. These differ not so much in the character of their courses nor in their general organization, but in the manner of their establishment and support. The *lycée* is entirely a state school, established, directed, and financed by the National Government. The *collège* is a secondary school of the same character in general established and supported by a *commune* (municipality), but under the surveillance, direction, and control of the central authorities. Thus schools of both types are under the direction and administration of the state and conform to the same general regulations as to curriculum, organization, administration, etc. While the two institutions are nominally of equal rank and are designed to provide similar education, the *lycée* stands higher in popular estimation and commonly is superior in the character of the work done. Theoretically at least, uniformity is the rule in the *lycée* and *collège* and the same standards obtain in all parts of the Republic, conforming to the particular and minute regulations of the central authorities.

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[1] *Report of the United States Commissioner of Education* (1913), vol. I, p. 799. Cf. *Revue Universitaire* (March 15, 1913), pp. 252–55.

The "secondary" school proper consists of two departments called *cycles*, one (*premier cycle*) of four grades, the other (*seconde cycle*) of three grades, — the two (which are sequentially related) providing education for boys of ages about ten to seventeen or eighteen. To the first cycle are commonly attached a preparatory department (*division préparatoire*) of two grades (ages six and seven) and an elementary department (*division élémentaire*) of two grades (ages eight and nine). In the first cycle, comprising grades sixth to third, pupils have a choice of two sections (A and B), *Division A* studying Latin and *Division B* not. In the second cycle, comprising the second, first, and philosophy-mathematics classes, a choice is offered in classes second and first of four sections (A, B, C, D). Roughly those sections may be classified as: *Section A* — Classical Course; *Section B* — Latin-Modern Language Course; *Section C* — Latin-Scientific Course; *Section D* — Science-Modern Language Course. In the Philosophy-Mathematics "form" pupils are divided into two general groups, one concentrating on philosophy, the other on mathematics, each of these groups being divided into Sections A and B. The general scheme may be seen from the plan of organization outlined on page 236.[1]

In addition to these regular divisions and sections there

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[1] *Plan d'Études*, etc., previously cited, p. x *ff*.

Organization of the French Secondary School for Boys.

<table>
<tr><th>Departments</th><th>Ages</th><th>Grades</th><th colspan="4">Organization of Courses, Sections, Divisions</th></tr>
<tr><td>Preparatory Division</td><td>6– 8</td><td>Dixième (10)
Neuvième (9)</td><td colspan="4">One group of all pupils. Studies: French, morality, writing, history, geography, arithmetic, drawing, singing, etc.</td></tr>
<tr><td>Elementary Division</td><td>8–10</td><td>Huitième (8)
Septième (7)</td><td colspan="4">One group of all pupils. Studies: more advanced work in studies begun in Preparatory Division.</td></tr>
<tr><td rowspan="2">First Cycle</td><td rowspan="2">10–14</td><td rowspan="2">Sixième (6)
Cinquième (5)
Quatrième (4)
Troisième (3)</td><td colspan="3">Division A</td><td>Division B</td></tr>
<tr><td colspan="3">Latin begun in (6): Greek begun by some in (4)</td><td>Modern Languages</td></tr>
<tr><td rowspan="3">Second Cycle</td><td rowspan="3">14–17</td><td>Seconde (2)
Première (1)</td><td>Section A
Classical</td><td>Section B
Latin-Language</td><td>Section C
Latin-Science</td><td>Section D
Science–Language</td></tr>
<tr><td rowspan="2">Philosophie-Mathématiques</td><td colspan="2">Philosophie</td><td colspan="2">Mathématiques</td></tr>
<tr><td>Section A</td><td>Section B</td><td>Section A</td><td>Section B</td></tr>
</table>

may be special sections in the *lycée* preparing boys for the military school at Saint-Cyr, the *polytechnique*, and the *école centrale.* In some cases also there may be a fifth section or subsection with a course of three or four years corresponding roughly to the *Realschule* course in Prussia.

It is to be noted that a much greater amount of flexibility is to be found in the French higher school for boys than in the German. The feature of flexibility was established in the reorganization of the curriculum of the school in 1902, and its introduction in part may have been due to the influence of the elective system in the American secondary school. Speaking of the curriculum established in 1902, M. Gabriel Compayré, former Inspector General of Public Instruction in France, said:

> The most striking feature is that, in place of one single and uniform course for all pupils, several are provided for their selection. Here is obvious the influence of the elective courses common in the United States, whose existence and success were noticed by the present writer in the *Report on American Secondary Education*, presented after his return from the World Exposition at Chicago to the Minister of Public Instruction in France in 1893.[1]

More detailed analysis of the French *lycée* is presented on page 238.

83. Other forms of secondary education in France. While the term "secondary education" (*enseignement secondaire*) is applied in France exclusively to the *lycée* and *collège*, certain types of schools also found in France must be considered as furnishing education more or less secondary in the American sense. The necessity of providing for an extension of school facilities for the common people somewhat beyond the primary schools and with special reference to their industrial needs was recognized as early as the passage of the Law of 1833 (the Guizot Law) authorizing the

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[1] Cf. Monroe, P., *Cyclopedia of Education*, vol. II, p. 663.

TABLE XCVIII. CURRICULUM OF THE FRENCH LYCÉE FOR BOYS *

Program of Studies and Hours — First Cycle

Grade	*VI*		*V*		*IV*		*III*	
Division	*A*	*B*	*A*	*B*	*A*	*B*	*A*	*B*
French	3	6	3	6	3	5	4	6
Latin	7	...	7	...	6	...	6	...
Greek	...	...	...	...	3 *a*	...	3 *a*	...
Modern languages *b*	5	5	5	5	3 *a*	4	3 *a*	5
History and geography	3	3	3	3	3	3	3	3
Mathematics	2	3	2	4	2	4½	3	4
Natural science	1	2	1	1	1	2½	...	2½
Ethics	...	...	...	...	1	1	1	1
Drawing	2	2	2	2	1 *a*	2	1 *a*	3
Total	23	21	23	21	23	22	24	24½

NOTES: *a.* Greek is elective. Boys not taking Greek take four hours of modern languages and two hours of drawing.
b. German, English, Spanish, Italian (Russian, Arabic).

Second Cycle

Grade	*II*				*I*				*Philosophie*		*Mathématiques*	
Section	*A*	*B*	*C*	*D*	*A*	*B*	*C*	*D*	*A*	*B*	*C*	*D*
French	4	4	4	4	4	4	4	4	...	...	...	...
Latin	4	4	4	...	5	3	3	...	4e	2e	...	...
Greek	5	...	...	...	5	...	...	...		...	...	...
Modern languages	2	7	2	7	2	7	2	7	2e	3	2	3
History and geography	4½	4½	3	3	5	5	3	3	3½	3½	3½	3½
Mathematics	2	2	4½	4½	2*d*	2*d*	5	5	2e	2e	8	8
Natural science	...	...	4½	4½	...	...	5	5	7½	7½	9	9
Drawing	2	2	4	4	*d*	*d*	4	4	2e	2e	1 2e	1 2e
Philosophy	...	...	...	...	...	...	...	...	8½	8½	3	3
Total	23½	23½	26	27	21	21	26	26	19½ −10e	22½ −6e	26½ −2e	27½ −2e

NOTES: *c.* 2 hours Latin additional is optional. *d.* Optional 2 hours additional in mathematics and 2 hours in drawing. *e.* Optional.

* Tables compiled from the data given in *Plan d'Etudes*, etc., previously cited, pp. 39–177.

establishment of higher primary schools (*l'école primaire supérieure*). The law had little effect until money was appropriated by the Government (beginning in 1878). The real development of the higher primary schools began in earnest after the passage of the law of 1892 which established two different types of such schools, the higher primary schools and practical schools of commerce and industry. These higher grade schools may retain pupils up to fifteen years of age, who for admission have obtained the primary-school certificate. The higher primary schools are not vocational though offering special courses in drawing, manual training, and elementary science. The vocational schools proper (*écoles pratiques*) provide for commerce and industry. The extent of these two types of schools in 1911–12 may be seen from the following table.

TABLE XCIX. PUPILS IN HIGHER PRIMARY SCHOOLS AND VOCATIONAL SCHOOLS, 1911 *

	Boys	*Girls*	*Total*
Higher primary schools and continuation classes	51,057	51,630	102,687†
Practical schools of commerce and industry	10,102	2,687	12,789
National technical schools	1,588	...	1,588
Total	62,747	54,317	117,064

* Data from *Report of the United States Commissioner of Education* (1913), vol. I, p. 791, corrected from data given, *ibid.* (1914), vol. I, p. 722.

† About one half of these were in continuation classes (*cours complémentaires*).

"Thus, altogether, about 118,000 young people of the industrial classes were continuing their studies in schools comparable with the upper grades and junior high schools of the United States." [1]

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[1] *Report of the United States Commissioner of Education* (1914), vol. I, p. 722.

84. Secondary education of girls in France. Previous to 1880 there existed no public secondary schools for girls in France. In that year a comprehensive system of public secondary schools for girls was established comprising national *lycées*, communal *collèges*, and secondary courses, the last being but a temporary expediency, paving the way for the later establishment of a secondary school proper. As in Germany, "secondary schools" for boys and "secondary schools" for girls are separate institutions, and in France they are of a radically different nature.

The "secondary schools" for girls comprise a five-year course divided into two departments, the first of three grades and the latter of two grades. Preceding the regular five-year course, however, there are commonly attached to the "secondary school" proper a one-year infant class and three elementary classes. In addition there exists a special class in some of the most important *lycées* designed to prepare girls for the normal school at Sèvres.

The curriculum and general organization of the secondary schools for girls may be seen from Table C.

85. Statistics of "secondary schools" in France. The figures presented in Table CI will indicate the number of secondary schools and secondary school pupils in France in 1912–13 — enrollment for *lycées*, *collèges*, and *cours secondaires* only.

While the differences in organization make comparisons difficult, it may be noted that in 1912 there was one "secondary school" to every 74,579 of the total population as compared with one public high school for every 8657 of total population in the United States: that in France in 1912 one person out of every 291 of total population was in some secondary school, while in the United States in 1911–12 one person in every 88 was in a public high school. The comparison is all the stronger when it is remembered that in the

TABLE C. PROGRAM OF STUDIES IN FRENCH SECONDARY SCHOOLS FOR GIRLS

Department		*Elementary course*			*Secondary school proper*				
Grade	*Infant class*	*I*	*II*	*III*	*I*	*II*	*III*	*IV*	*V*
French	6.5	6.5	6.5	6.5	5	5	3.5	3	2
Modern languages	2.5	2.5	2.5	2.5	3	3	3	3+2 *d*	3+2 *d*
History	1	1	1	1	2	2	2	2	2
Geography	1	1	1	1	1	1	1	1	1
Mathematics	...	2.5	2.5	2.5	2	2	2	0.5+2 *d*	0.5+2 *d*
Natural science	...	0.5	0.5	0.5	1	1	2	2.5	3
Ethics	...	...	...	...	...	...	1	1	...
Domestic economy and hygiene	...	...	...	...	...	...	*b*	...	...
Sewing and needle work	*a*	*a*	*a*	*a*	2 *c*	2 *c*	2 *c*	+2 *cd*	+2 *cd*
Drawing	*a*	*a*	*a*	*a*	2 *c*	2 *c*	2 *c*	+2 *cd*	+2 *cd*
Singing	...	...	...	...	1 *c*	1 *c*	1 *c*	+1 *cd*	+1 *cd*
Gymnastics	...	...	...	...	1.5 *c*	1.5 *c*	1.5 *c*	+1.5 *cd*	+1.5 *cd*
Psychology	...	...	...	...	...	...	...	...	2
Common law	...	...	...	...	...	...	...	...	0.5
Ancient literature[e]	...	...	...	...	...	...	...	1	...
Modern literature	...	...	...	...	...	...	...	...	1
	11+*a*	13+*a*	13+*a*	13+*a*	20.5+	20.5+	21+	14+	15+

NOTES: *a.* Time not definitely set.
b. 12 one-hour lectures.
c. Minimum time.
d. Optional.
e. Latin language taught in a few *lycées* preparing for the baccalaureate examinations.

TABLE CI. FRENCH SECONDARY SCHOOLS AND PUPILS IN 1912–13 *

	Schools			*Pupils*		
	Boys	*Girls*	*Total*	*Boys*	*Girls*	*Total*
Lycées	112	53	165	62,092	19,898	81,990
Collèges	230	79	309	36,796	11,882	48,678
Secondary courses	...	57	57	...	5,565	5,565
Total	342	189	531	98,888	37,345	136,233

* Figures taken from *Annuaire Statistique*, vol. 32, pp. 26–31, 24 *.

French secondary schools for boys seven grades or more are included and in the secondary schools for girls eight or more grades are included, whereas in the American high school but four grades are considered. It cannot be considered that the needs for secondary education in France are being met in any adequate manner. This is in part due to the social distinctions already referred to, in part to the inadequate provision for secondary schools, and in part to the fact the secondary education in France is not free. Combined with those factors is the fact that the French *lycées* and *collèges* are in part boarding-schools, a fact which seriously affects the matter of popular education. Approximately one third of the pupils in the *lycées* and *collèges* for boys are boarders or half boarders. This fact indicates clearly that schools are not numerous enough nor located centrally enough to meet the needs of many, and that the cost of living away from home prevents many boys from receiving the benefits of a secondary education. The actual fees charged, however, are not large from the American viewpoint. In the provincial *lycées* the range of fees is from 40 francs ($8) per annum for day pupils to 700 francs ($140) per annum for boarders in the infant classes and from 320 francs ($64) per annum for day pupils to 1250 francs ($250) per annum for boarders in the highest classes. In Paris and the larger *lycées* the fees are somewhat higher.

86. The secondary-school teacher in France. As in Germany so in France the character of the teaching staff stands out in strong contrast to the character of the teaching staff of the American secondary school. This is due to several factors, the principal of which are the training which the secondary school teacher in France must undergo, the relatively small number of teachers required, and the esteem and honor in which the profession is held. Due in part to the two last factors the competition for secondary school positions is so severe that the best material for teachers is secured through the elimination of the poorer.

In point of professional requirements the minimum qualifications of a candidate to teach in the secondary school are: (*a*) the bachelor's degree from a *lycée* or *collège;* (*b*) two or three years of university or normal-school study. This accomplished the candidate receives a *licence.* The holder of a *licence* may then become a candidate for the title of *agrégé* which requires the passing of a severe competitive examination necessitating at least two years' preparation. Holders of this title only are appointed to positions in the *lycées* where the *professeur agrégé* has a legal right to a position as professor with practically life tenure. The standards for teachers in the *collège* are distinctly inferior to those for teachers in the *lycée*, a fact which to some extent explains the acknowledged inferiority of the work done in the former. In the *collège*, in addition to some *professeurs agrégés* and those holding the master's degree, are found some teachers holding the bachelor's degree only or those with special certificates.

Again as in Germany the salaries paid appear small to the American teacher. All teachers in the secondary schools are divided into six classes. The teacher must have been at least two years in service before he is eligible for promotion from the sixth class (the lowest) into the next class. He must have been nineteen years in the service before he can be promoted into the first (highest) class. For full professors in the *lycées* (who receive the highest salaries for teaching alone) the pay ranges in the provincial schools from 3700 francs ($740) to 6700 francs ($1340). In Paris the salary for the regular professor ranges from 5500 francs ($1100) to 9000 francs ($1800), *professeurs agrégés* each receiving 500 francs ($100) additional.

Women teachers in the secondary schools for girls secure appointments by completing the work of the secondary school and securing its diploma and by securing the *agrégation*. Ordinarily the certificate to teach in the girls secondary school is obtained after completing the second year of work in the normal school and passing competitive examinations.

87. Secondary education and the social organization in France. France in the not very distant past has at different periods been a monarchy, an empire, and a republic, and each of those stages through which French society has passed has left its mark on the secondary schools of France at the present time. The social distinctions manifest in the differentiation between "elementary schools" and "secondary schools" is in part at least a result of the days of the monarchy and aristocratic prestige. The high degree of centralized control shows the effect of Napoleon's administration during the First Empire. Recent reorganization and numerous separate movements indicate an attempt (rather than its fulfillment) to adapt the secondary schools to the demands of a modern republic.

A form of secondary education adapted to a republican or democratic form of social organization would appear to postulate at least three important characteristics: (1) schools free to all children and open to all classes on an equal basis; (2) schools sufficient in number to afford adequate means for educating as many children as can attend and so located that undue expense is not to be incurred by their parents; (3) schools and courses so diversified as to meet the needs of all classes of children. In no one of those three important respects can the French Republic be said to have approached the solution of democratic or republican education. Fees are regularly charged; secondary schools are quite insufficient in number and not satisfactorily distributed; while the curricula established in 1902 did much to provide flexibility of studies adapted to the diversified needs of pupils, insufficient provision has as yet been made for many forms of education, and in the case of girls unjust discrimination has been made with regard to provision for education leading to the university.

88. Secondary education in France and America. Much that has been said in comparing secondary education in Germany and in America may also be said in comparing secondary education in France and America. Thus secondary education in France and in Germany differs from that in America in the following important respects: (*a*) the triple school systems running more or less parallel and without effective articulation; (*b*) the separation of those systems along lines of social and economic cleavage; (*c*) the separation of secondary education for boys and girls; (*d*) the earlier beginning of secondary education in the schools; (*e*) the absence of administrative division between elementary and secondary education in the American sense of those terms, and the gradual transition from lower to higher forms of education; (*f*) the complete separation of vocational schools from other schools; (*g*) the intensive education provided in the higher schools leading directly to professional work in the university without the interposition of college; (*h*) the existence of uniform courses of study for all schools of the same type; (*i*) the high character of the teaching staffs; (*j*) the fact that the number of "higher schools" is relatively small and that a relatively small number of boys and girls are enrolled in higher schools other than special vocational schools, etc.

Governmentally France is republican or democratic: educationally it is aristocratic. In many respects France and America have common fundamental problems to solve through education and in no small degree through secondary education. As at present organized the secondary schools of France are better suited to a non-democratic form of society than to a republic, are more comparable to those of monarchal states of Europe than to those of America, and in organization and administration have little to offer to the student of secondary education in America.

III. Secondary Education in England

89. Organization of secondary education in England. In Germany and in France the State control of secondary education was early assumed and at present is practically complete, with the result that secondary education in those countries may be interpreted in terms of organized systems wherein uniformity and standardization are the rule. In England, on the other hand, there has always been manifest a reluctance on the part of the State to assume the responsibility for a real public system of education. Thus it was not until 1870 that any real system of elementary schools was inaugurated and it was not until 1902 that any real progress was made in the establishment of a system of public secondary schools. Even at present it is scarcely possible to speak of a system of secondary schools, but several different types or systems must be considered.

In England more than in any other country private initiative has controlled education and particularly secondary education. From the beginning of secondary education in that country dominant control in the field of secondary education has been exercised by the clergy, by corporations (independent foundations, guilds, etc.), and by individuals. During the latter half of the nineteenth century municipalities assumed more and more influence. Only within the past few years has any serious attempt been made to organize national control over any part of secondary education.

In the following sections two general classes of secondary schools of England will be considered briefly: (1) Endowed and private schools, with particular attention to the "great public schools" of the "first grade"; (2) secondary schools which have to some extent come within the supervision of the Government and are on the "grant list" or the list of "efficient" schools.

90. The "Great Public Schools" of England.[1] For more than five centuries after their beginning in 1382 the "great public grammar schools" were the dominant institution for secondary education in England and their unchallenged preëminence continues at the present time. In 1867 the

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[1] The reader familiar with the nomenclature of American schools must beware of misinterpreting the nomenclature of the English schools. The term "public" is applied in England to the endowed schools here mentioned which are just the reverse of the "public schools" of the United States. Since the majority of those schools are boarding-schools, the American reader is likely also to misinterpret the term "board schools," which is regularly applied in England to schools under the control of school boards and has nothing to do with boarding-schools. The term "grammar schools" is to be understood from the old Latin grammar school and, of course, has no reference to the term as employed in the United States for the "grammar" grades of the elementary school. Further, "preparatory schools" in England prepare for the "great public schools," not for the university as the "preparatory schools" in America prepare for college.

British Schools Inquiry Commission placed those schools in an exclusive class comprising the "first-grade" secondary schools, a distinction which obtains informally at present. In this group the following (and no others) were included: Winchester (founded in 1382), Eton (1440), Shrewsbury (1552), Westminster (1560), Rugby (1561), Harrow (1571), Charterhouse (1611), St. Paul's (1509), Merchant Taylors' (1561). Of these all except the two last-mentioned are boarding-schools. The historic importance of these schools, the selected class of their patronage, and the superior character of the education provided has given them a preëminent position among the secondary schools not only of England but of the world, and justifies the view which regards them as national institutions. They occupy a position in England that is paralleled by no other institution for secondary education in any other country and their influence on English history and on English society has probably been greater than any other institution. Any complete analysis of their place among the schools of England would carry us far beyond the limitations of our present purpose. We may note, however, certain material points. Schools of that type cannot properly be considered as an important part of a system of public secondary schools which is designed for boys in general. The opportunity for secondary education in such schools must perforce be limited, highly selective, and restricted. Although they are termed "public schools," they are essentially private, and stand in strong contrast to the secondary schools of Germany, France, and America. It may well be questioned whether the existence of such highly selective schools not directly controlled by the State have not acted as a serious check on the development of a system of real public secondary schools.

Needless to say, schools of this type are conservatively classical and are dominated by preparation for entrance to the university. Programs of study and organizations differ for the several schools so that it is impossible to present even a typical program. Language, especially the ancient languages, and mathematics all but monopolize the curriculum. According to the specialist in education in foreign countries (United States Bureau of Education) a typical program comprises the following subjects:[1]

Classical side: Religion, English, Latin, Greek, French, history, geography, arithmetic, mathematics, natural sciences, drawing, singing.
Modern side: Mathematics, English, Latin, French, German, history and geography, natural science, drawing, singing.

Boys enter these schools at the age of thirteen or fourteen after a "preparatory" course in one of the numerous private "preparatory schools" which exist almost solely for the purpose of preparing boys for admission to the endowed schools. Nominally there are six "forms" or grades, though the lowest is frequently omitted and in some schools other forms are missing. Grading and promotion are flexibly organized and administered and it is possible for each boy to pass through the school much according to his individual ability and application. However, if he reaches the sixth form early he commonly remains in that grade until about the age of eighteen or nineteen when he enters the university.

91. Other endowed and private secondary schools. In addition to the nine "great public schools," comprising the group of "first-grade secondary schools," there is a very large number of other endowed, proprietary, and private secondary schools. Some of these endowed schools are of a character quite comparable to that of the "first-grade" schools except, perhaps, in historical and social prestige. Proprietary and private schools controlled by individuals, stock companies, etc., range all the way from very good to very bad. Their varied character prevents anything like satisfactory analysis in small space. In general these schools all imitate the great public schools. Some of the best in every important respect should be ranked on a par with the "first-grade" schools. At the other extreme are schools which must be considered as commercial ventures of a pernicious character. Between the two extremes are found schools of all sorts and grades.

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[1] *Report of the United States Commissioner of Education* (1916), vol. I, pp. 676–77.

92. The old municipal "board" secondary schools. While there was no serious attempt to develop a national system of secondary schools in England until the period 1899–1902, and while the numerous endowed and private secondary schools dominated the field, many municipalities throughout the country had established public "board" schools under the control of local authorities. Their characters varied widely according to the different communities, and uniformity was not to be found. With the beginning of the development of a national system in 1899–1902 those "board" schools were merged into schools of the type considered in the following section.

93. "Grant-list" and "efficient" secondary schools. The beginning of a system of public secondary schools in England is found in the creation of a Board of Education for England and Wales in 1899 which provided a central agency for educational affairs. By the law of 1902 the control of non-private secondary schools was taken out of the hands of the older school boards and placed in the hands of county and county-borough councils. That act provided:[1]

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[1] *Report of the United States Commissioner of Education* (1914), vol. I, pp. 686–87.

> The local education authority shall consider the educational needs of their area and take such steps as seem to them desirable, after consultation with the board of education, to supply or aid the supply of education other than elementary, and to promote the general co-ordination of all forms of education.

In accordance with this law new schools of secondary character supported by public funds have been established and others brought within the scope of State-aided secondary education. The Board of Education has adopted a scheme of granting national funds to local schools as a means of bringing the secondary schools under its supervision and to some extent under its control. The acceptance of aid from the Board of Education and submission to its supervision is voluntary on the part of the school authorities, but when the school accepts grant aid it must meet the requirements and submit to the supervision of the national authorities. This method of increasing the State control of secondary education has been successful in American States and bids fair to establish a real system of secondary schools in England and Wales. Within about a dozen years after the beginning of the movement its success has been great. According to the latest official returns (before the war) the number of secondary schools in England receiving grants was 898, including 402 controlled by local authorities, 424 endowed schools, 26 schools belonging to the Girls' Public Day School Trust, and 46 controlled by Roman Catholic orders or communities. These schools enrolled 158,832 pupils (85,110 boys, 73,722 girls) and employed 9126 full-time teachers and about 3000 part-time instructors.[1] These are known as "grant-list" schools. In addition there are a number of private secondary schools which invite the inspection of and a certain amount of supervision by the

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[1] *Report of the United States Commissioner of Education* (1914), vol. I, pp. 687–88.

Board of Education but which do not conform entirely to the requirements for grant aid. These are known as "efficient" schools. Altogether in 1913–14 there were 1176 secondary schools in England, with an enrollment of about 222,275 pupils, in some relation to the Board of Education.[1] However, the majority of private schools do not come within this system.

The reader will not fail to note that the situation in England at the present day is somewhat analogous to the situation in the United States in the middle of the nineteenth century when the public high school was in the midst of its struggle for supremacy with the private academy. He should note also that the regulations of the Board of Education provide that a certain proportion of places in the grant-aided secondary school (ordinarily about twenty-five per cent) must be open free to the class of children that attend the public elementary school. Thus, although falling far short of thoroughly democratic ideals of free public education, the regulations of the Board of Education have greatly improved the opportunities of the common people for secondary education.

94. The curricula of English secondary schools. It is totally impossible to speak of the curriculum of the English secondary school in the definite sense in which one may speak of the curriculum of German or French higher schools. In the more prominent endowed and private schools there is a certain amount of uniformity determined by the fact that they have a common aim — preparation for the university. The conservative character of the older schools will probably change only as the spirit of modernism affects the universities. In the lesser private schools the curricula vary more or less according to the particular classes of patronage invited or given. In the grant-list schools there is manifest a tendency to develop greater uniformity, although that is far from having been consummated at present.

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[1] *Report of the United States Commissioner of Education* (1916), vol. I, p. 677.

The Board of Education defines a secondary school as one which

> offers to each of its pupils a progressive course of instruction . . . in subjects necessary to a good general education, upon lines suitable for pupils of an age range as wide as from twelve to seventeen.

If such a school is to receive "grant aid" the following subjects must be offered and are obligatory: English language and literature, at least one language other than English, geography, history, mathematics, science, and drawing. A curriculum including two languages other than English, but making no provision for instruction in Latin, will only be approved where the board are satisfied that the omission of Latin is for the educational advantage of the school. Instruction in science must include practical work by the pupils. Adequate provision must be made for organized games, physical exercises, manual instruction, and singing. Schools for girls must offer practical instruction in domestic subjects, such as needlework, cookery, laundry work, housekeeping, and household hygiene. Considerable latitude is allowed the local authorities to adapt the curriculum to special local needs.

95. **The secondary education of girls in England.** As in all countries of Europe the education of girls was long delayed in England. There, too, as in America, Germany, France, and other countries, secondary education for girls began as a result of private initiative. The movement was particularly noticeable in the decade or so preceding 1892 when endowments had been established for about forty-five girls' schools. The Girls' Public Day School Company (Trust), one of those semi-private, semi-public school societies which have been so active in the educational his-

tory of England, established thirty-four schools between 1873 and 1897. Many of those schools, together with others, came under the regulations of 1902 regarding grant aid, and thus came more or less into the public "system" in the sense previously suggested.

While coeducation is by no means the usual practice in secondary schools in England (quite the opposite, of course, in endowed and private schools) economic factors have affected the situation in many smaller communities and even in some of the larger towns. Of the 928 schools in England and Wales which were recognized by the Board of Education as "efficient" in 1909–10, there were 150 schools in which boys and girls were taught together throughout the school and 23 in which they were taught together in some classes.

96. Secondary schools and other departments of education. The absence of an organized system of education in England necessarily means a lack of close articulation between the various departments. The more prominent endowed and private schools recruit their pupils from the "preparatory schools" which are designed almost exclusively to prepare boys for the examinations via which they may pass into the secondary schools. In 1910 there were about 360 schools of that type with an average enrollment of thirty-seven pupils. Each important "public" school has its own group of fitting schools.

With regard to the public elementary schools:[1]

> The official regulations declare it to be "an important though subsidiary object of the elementary school to discover individual children who show promise of exceptional capacity, and to develop their special gifts — so that they may be qualified to pass at the proper age into secondary schools, and be able to derive the

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[1] Cf. Smith, A. T., in Monroe, P. (Editor), *A Cyclopedia of Education*, vol. II, p. 473.

maximum of benefit from the education there offered them." The transfer of pupils from elementary to secondary schools should take place not later than the twelfth year or age, but an earlier age is encouraged by a grant paid on transferred pupils between the ages of ten and twelve years. The main grant in secondary schools, however, is paid in respect to pupils between the ages of twelve and eighteen years.

For children of ordinary ability who leave the elementary school at twelve or thirteen years of age, evening schools offer opportunity for continued training, and as these schools are classed under the head of higher education, there are two diverging roads leading upward from the elementary schools.[1]

For public schools the general scheme of articulation may be seen from the following table which approximately represents the situation.

TABLE CII

Age in years	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*
Elementary "standard"...	*I*	*II*	*III*	*IV*	*V*	*VI*	*VII*						
Secondary school.........				– – –	– – –	1	2	3	4	5	– – –		
Higher elementary school..						1	2	2	(4)				
Continuation school						1	2	3	4	5			
Higher institutions........											– –	– –	

It may be seen from this rough table that the articulation between the elementary and secondary schools is loose or flexible according to one's viewpoint. The overlapping of the last grades of the elementary school and the earlier grades of the secondary school is noticeable. The draft which the "grant-list" schools make on the public elementary schools may be observed from Table CIII.

Admission of students to the college or university is always through examinations. To the universities of Oxford and Cambridge boys are commonly admitted via examinations from the endowed and private schools. Modern regional universities, such as those of London, Manchester, etc., draw their students from a less restricted class.

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[1] *Board of Education Report* (1911–12), pp. 48, 60.

TABLE CIII. ENROLLMENT OF PUPILS IN ENGLAND AND WALES, 1911–12 *

Elementary schools	6,041,921
Secondary schools on grant-list	165,617
Technical, art, and evening schools on grant-list	843,738
Higher elementary schools	9,360

* *Report of the United States Commissioner of Education* (1913), vol. I, pp. 738–39.

97. Secondary schools and the social organization in England. For centuries the greater part of secondary education in England has been carried on by private and endowed institutions, the great majority of which were boarding-schools. In no other country has the private or semi-private school played so large a part in secondary education, and probably in no other country has the boarding-school played so important a rôle, though common throughout Europe. In its dependence on private secondary schools England stands in marked contrast with Germany, France, America, and most important states. Objections to the non-public school in England are many and its weaknesses are evident. It has prevented or at any rate delayed, the development of free public and universal secondary education. It has prevented many children from receiving the benefit of higher education. It has fostered conservatism and tradition. It has prevented a desirable degree of uniformity and standardization in secondary education. It has been a system of education which was well adapted to the needs and opportunities of a few, but it has neglected the needs of the many. It has fostered a spirit of class distinction of great social significance. All these strictures are justified and are recognized in England as well as elsewhere. On the other hand, if the theory dominant in English education up to the present be accepted, if it be granted that secondary education for the purpose of developing leaders is a tenable theory, then many advantages can be shown to have resulted from the English secondary schools.

To the selected group of boys who are able to attend such schools as are represented by the better class of endowed and private institutions there is afforded an *education*, a *training* which is far more than *instruction* with emphasis on the intellectual side. Whatever faults may be attributed to English secondary schools of the type considered here, they must certainly be balanced in part by the character of the moral, social, and physical training which the endowed schools of the better class undoubtedly afford. To that training certain elements evidently contribute much: the athletic and out-of-door life which is even more extensive than in America; the intimate social relations between the students and between students and teachers; the high traditional ideals which permeate the whole atmosphere of the schools. All this has had its effect and has made the endowed schools of England a powerful force affecting English society and public life. For instance, Eton alone has furnished England with ten prime ministers, twenty-two governor-generals of India, and innumerable cabinet ministers and other public men.

While the secondary education afforded by the endowed and private schools of England has been satisfactory for the higher classes — probably superior to that which will ever be afforded by purely public schools — secondary education for the other classes of society has been quite inadequate. The movement inaugurated by the act of 1902 was the result of a recognition of the inadequacy of existing forms of secondary education with reference to the needs of the middle and lower classes. If the plans of the Board of Education and of educators in general succeed, a real approximation to equality of opportunity in secondary education may be expected in England in the not-distant future. Such a movement should mean: (1) an extension of truly public secondary schools; (2) the elimination, or at any rate the reduction, of tuition fees now regularly charged even in the "grant-list" secondary schools; (3) the greater extension of courses adapted to the differentiated needs of boys and girls; (4) a great reduction in the number of privately and ecclesiastically controlled secondary schools; (5) a change in the attitude of the people toward social distinctions in secondary education.

PROBLEMS FOR FURTHER CONSIDERATION

1. Consider the dominant ideals of Prussian society as affecting her secondary schools.
2. Consider the dominant social ideals of France as affecting her secondary schools.
3. Consider the dominant ideals of England as affecting her secondary schools.
4. Compare the articulation of secondary education with other departments of education in France, Germany, England, and the United States. Make a chart correlating age, grade, and type of school.
5. Compare the curricula of French, Prussian, and American secondary schools with special reference to: (*a*) rigidity or flexibility; (*b*) the proportionate amounts of time devoted to special subjects or groups of subjects; (*c*) distribution and concentration; (*d*) amount of time in weekly schedule, etc.
6. Compare the facilities for the secondary education of girls in Europe and in America.
7. Compare the status of private or semi-private secondary schools in Germany, France, England, and America.
8. Consider the relation of ecclesiastical influence to secondary education in Germany, France, England, and America.
9. Compare the training, qualifications, teaching efficiency, social status, salary, etc., of secondary school teachers in Germany, France, England, and the United States. Russell, Farrington, J. F. Brown.[1]
10. Compare opportunities for free and universal secondary education in Germany, France, England, and America.
11. Compare the teaching of special subjects of study in German, French, and American secondary schools. Russell, Farrington.[1]
12. Compare the facilities for vocational schools, trade schools, continuation schools, in Germany, France, England, and the United States. How are they related to secondary education?
13. Make a special study of the school system of Sweden as reorganized

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[1] Cf. the references in the following bibliography.

in 1904. (Cf. *Report of the United States Commissioner of Education* (1913), vol. I, pp, 763 *ff*.)

14. Make a special study of the Folk High Schools of Denmark. (Cf. Bulletins of the Bureau of Education (1913), no. 58; (1914), no. 5.
15. Make a special study of the movement toward a "national system" of education in England with special reference to the laws of 1902, 1906, *et seq*.

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Cf. also *Reports of the United States Commissioner of Education*, cited above.

CHAPTER VII

SECONDARY EDUCATION IN RELATION TO ELEMENTARY EDUCATION

I. General Considerations

98. **Factors involved in making distinctions.** The division of the system of education in the United States into the two administrative departments of the elementary school and the secondary school is more the result of chance than of any attempt to build up a properly articulated system of schools. The fact that present conditions have not always obtained in this country and the fact that systems of education in other countries differ radically from that in America suggest that our present distinction between elementary and secondary education and the existing relation between the two divisions of education may possibly be improved by an examination of the factors which should determine the character of the system. The first step in such an examination is the consideration of distinctions which have been made between elementary and secondary education.

Apart from distinctions based on administrative divisions of the system of education, elementary and secondary education have been distinguished in numerous ways: on the basis of the chronological age of the children concerned; on the basis of stages of physiological or psychological development, with special reference to the phenomena of puberty; on the basis of social factors; and on the basis of the character of the studies pursued.

99. **Distinctions based on chronological age.** When an attempt is made to define elementary education and second-

ary education in terms of the chronological ages of the children taught, it is found that such a criterion is a crude measure as applied to the actual situation. Theoretically in the United States the system of secondary education is in part based on the assumption that the children in attendance at the elementary schools and secondary schools are of ages conforming roughly to the standard illustrated in the following table.

TABLE CIV

	Elementary school								*High school*			
Grade......	1	2	3	4	5	6	7	8	I	II	III	IV
Age........	6–7	7–8	8–9	9–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18

How far the actual distribution of children is from the standard set may be seen from the figures given in Tables II, III, and XXV. In most school systems a larger number of fourteen- and fifteen-year-old children is found in the elementary school than in the secondary school, and in all cases the variability of age with reference to grade and of grade with reference to age is so great as to make chronological age but an approximate criterion of the delimitation of elementary and secondary education. In a general sense only is chronological age to be used as a measure of school progress. It can never afford a line of clear demarcation.

100. Distinctions based on development. The distinction between elementary education and secondary education has been based on stages in the physiological and psychological development of children more frequently and more persistently than on any other one factor. In general it is a fact which may be accepted that the majority of boys and girls in the elementary school have not yet reached the stage of adolescence and that the majority of boys and girls in the high school have reached that stage. It is nevertheless true that adolescent boys and girls are found in the elementary schools in practically as large numbers as in the high schools of most school systems. It is further true that a significant proportion of boys and girls in the early grades of the secondary school have not yet reached the stage of adolescence. It must be recognized that in American schools pupils in the later grades of the secondary school are predominantly adolescent or pubescent and that pupils in the earlier grades of the elementary school are predominantly immature. In the later grades of the elementary school, however, and the earlier grades of the high school (especially in the first year) non-adolescent pupils and adolescent pupils are intermingled to such an extent that any clear distinction between elementary education and secondary education is impossible at the very point where distinction is important. In general (but only in general) we may say that pupils in grades one to five or six of the elementary school form a group roughly homogeneous with respect to the phenomena of adolescence (being predominantly immature), that pupils in grades seven and eight of the elementary school and in the first grade of the high school form a group widely variable, and that pupils in the last three grades of the high school form a group roughly homogeneous with respect to adolescence (being predominantly mature). The bearing of theories of periodic or concomitant development and of saltatory or gradual development on this problem has already been discussed.

Somewhat allied to the distinction based on the difference between immature (non-pubescent) pupils and maturing or mature (pubescent and postpubescent) pupils is that suggested in the following quotation:

> There is a stage in mental development, above the empirical stage and below the philosophical, which we may call the "scientific." The grade of education corresponding to this intermediate stage may, quite naturally, be called secondary, that below it being called primary, and that above it, higher. The primary or ele-

mentary division deals mainly with things in their unessential relationships, their resemblances and differences, their collocation in space, and their orderly arrangement in temporal series. It rises, to be sure, to general ideas, but hardly arrives at logical definition of its ideas. The secondary division deals with ideas more clearly defined; and it comes to an understanding of things as organized into coherent systems through the operation of such principles as those of mechanical causation and human imitation. These principles have already become familiar, to be sure, in the earlier stage, but not in their larger significance.[1]

As indicating a general truth concerning the intellectual processes of the immature and the mature pupil such a suggestion may be accepted. The statements cannot, however, be taken as indicating any clear distinction between elementary education and secondary education as far as the transition point between the two is concerned. The obvious relation of the definitions to theories of serial or periodic and saltatory development will not escape the reader.

101. Distinctions based on social factors. Distinctions between lower and higher education based on social factors are more common and much more important in European states than in America. It has already been pointed out that lower and higher education in Germany and France are separated by lines of social and economic cleavage and have but little articulation. It has also been pointed out that the terms elementary education and secondary education, elementary schools and secondary schools, should be interpreted with great caution when any comparison is attempted between foreign and American schools.

Social distinctions between elementary education and secondary education have not been entirely wanting, however, in America. Their basis is found in the conception that elementary education is appropriate for all children while secondary education (of necessity in practice if not of choice or theory) is limited to a relatively small proportion of children. Such a conception is more or less manifest in compulsory education laws and at times has been to some extent effective in determining educational theory and practice. It is, for instance, involved in the following statement by Hadley:[1]

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[1] Brown, E. E., *The Making of Our Middle Schools*, p. 3. Quoted with the permission of the publishers, Longmans, Green, & Co.

> Secondary education, under the definition which I would suggest, includes all those studies which are regarded by the public as too far advanced to be a part of the compulsory education which it strives to furnish to all citizens, and which are at the same time not sufficiently specialized in their purpose to be considered part of the technical preparation of different groups of citizens for their several callings in life. It is distinguished on the one hand from primary education by being less universal. It is distinguished on the other hand from technical education in its object; in fitting the student to be a better man rather than a more expert producer. Speaking roughly, primary education aims to secure the necessary level of general intelligence; technical education aims to secure the necessary level of professional intelligence; secondary education aims at something in excess of the necessary minima.

While such a distinction between the three divisions of the system of education may by some be considered valid "speaking roughly," it is obvious that no clear line of demarcation can be determined by the criteria suggested, the point (grade) at which the "level of general intelligence" ends and "something in excess of the necessary minima" begins being still undetermined.

102. **Distinctions based on studies.** As late as 1912 in schedules sent out by the Federal Bureau of Education a secondary-school student was defined as follows:[2]

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[1] Hadley, A. T., "The Meaning and Purpose of Secondary Education," *School Review*, vol. x, p. 732.

[2] Bureau of Education Bulletin (1912), no. 22, p. 5.

> Secondary student (or high-school student) should be taken as meaning a student who has completed an elementary-school course of at least seven years in length (ordinarily eight years) or its equivalent, and has pursued within the past year at least two recognized high-school studies, e.g., Latin, French, German, algebra, geometry, physical geography, physics, general history.

Any such definition of secondary education is, of course, totally arbitrary and as a matter of fact is already out of harmony with present-day theory and practice. The history of education shows clearly that no criterion could be more untrustworthy than one dependent for its meaning on specific subjects of study. This is particularly true since the development of vocational secondary education.

A distinction offering a nearer approach to criteria of elementary and secondary education is that which defines the work of the elementary school as primarily involving the training of children in the fundamental tools of education such as that now forming the bulk of the work of our elementary schools. That training in the fundamental tools of education and of life is a primary function of elementary education must be recognized. Few would, however, admit that such training is the sole function of the elementary school. Few likewise would be willing to admit that even all the fundamental tools can adequately be acquired in the elementary school. Here language offers a good example. The mechanics of reading, writing, spelling, and other forms of language work can doubtless be acquired in a relatively short time. Surely, however, the development of ability to employ the language tool is not completed by such attainments. The proper relation of reading, writing, spelling, and the like to the development of ability to use language as an instrument for thinking and for the expression of thought is not established within the period of elementary education as now constituted. Only on the supposition that we can establish definitely the point at which studies cease to be "fundamental tools" and become something else could we distinguish between elementary education and secondary education on such a basis.

103. **The fallacy of sharp distinctions.** When elementary education *as a whole* is compared with secondary education *as a whole*, all the points of distinction considered in the preceding sections are valid. Pupils in the secondary school are of an average older age than those in the elementary school. Likewise they are predominantly pubescent or post-pubescent while pupils in the elementary school are predominantly immature. Pupils in the secondary school are a more select group socially and economically than those in the elementary school. Studies in the secondary school are different in kind and require higher degrees of mental abilities than those in the elementary school. However, when such general distinctions are made the basis of lines of sharp demarcation between the two divisions of education, the dangers of the "group fallacy" become very great. Having once classified pupils by total groups in the elementary or secondary school we tend to become the victims of our own classifications, assuming that what is true of the group as a whole is true of the various sub-groups or individuals of that group. Hence we tend to think of pupils in the last grade of the elementary school and pupils in the first grade of the secondary school as manifesting the same differences as those found between elementary-school pupils as a whole and secondary-school pupils as a whole. Such procedure is fallacious in the extreme.

The primary criterion of the relation between the various parts of the school system is found in the character of the development of boys and girls. This factor was considered at some length in Chapters I and II. There the conclusion was reached that no abrupt change in education is justified at any point in the school system, but that the development of the individual being essentially a gradual, continuous, and unitary process, demands a gradually changing, continuous, and unitary process of education. Hence on this basis the school system should be without points of abrupt transition and the change from what is characteristically elementary to what is characteristically secondary education must be gradual.

While the character of the development of children demands that the transition from elementary education to secondary education be gradual and continuous, it must be recognized that the exigencies of school organization and administration necessitate changes at some point or points which must to some extent interfere with the transition of pupils from division to division of the school system. Somewhere in the course of the pupil's progress he must be transferred to a different building. Somewhere the change must be made from the single common course typical of elementary education to the field of differentiated courses of the secondary school, from the single-teacher-per-group system to the departmental system, from the administrative régime of the elementary school to that of the secondary school. Under our present organization the majority of those changes are made abruptly and at the same point. This is neither necessary nor desirable. It should be an aim of organization and administration to see to it that the necessary changes be made in such a way that the transition of the pupil shall be gradual and continuous as far as may be possible.

The point should be emphasized that, however clearly we may distinguish between elementary education as a whole and secondary education as a whole, any attempt to draw a sharp dividing line between the two is contrary to the dictates of sound pedagogy. There is no clear line of demarcation between elementary and secondary education. The former merges into the latter by imperceptible degrees.

II. Historical and Comparative Considerations

104. Historical development. The sequential relation of elementary and secondary education (wherein secondary education is conceived as a continuation of training following and dependent on elementary education) represents a relatively recent stage of development and one found in complete form only in America and in countries more or less affected by American practice. When we examine the earlier forms of education in Europe (to go back no farther than the Renaissance and Reformation periods), we find existing two different types of schools, the so-called secondary school (gymnasium, Latin grammar school, etc.) and schools of a lower type in which were taught only the rudiments of reading and writing. Schools of the former type were designed for the education of the higher classes. Schools of the lower type afforded a rudimentary education (it can scarcely be called an elementary education) for a few of the less fortunate class. Between these two types of schools there existed no recognized articulation, as there existed little opportunity for change from one class of society to the other. It is quite misleading in many respects to differentiate these schools as elementary and secondary schools. Rather we should say that there existed during the Renaissance and Reformation periods one rather complete system of schools designed for the higher classes and another type of school (it can scarcely be called system) for some of the lower classes. This is all the more true since the higher type of school either provided its own "elementary education" or depended on home or tutorial training for reading and writing instruction.

Out of those two types of schools have developed the modern "elementary" and "secondary" schools of Europe which only in the most recent times have been brought into very incomplete articulation and which still manifest clearly the lines of social distinction inherited from earlier days.

105. The development of articulation in America. The American system of articulated elementary and secondary education stands in marked contrast with the more or less parallel systems of Germany, France, and other European countries, where social and economic lines in large part determine the differentiation. It must not be supposed, however, that the American system of articulated schools originated in anything like its present form. The first secondary schools in this country, the colonial Latin grammar schools, were in no definite way articulated with the "reading and writing" schools, "dame schools," etc., which constituted the lower schools of the period, but were complete in themselves, being connected only with the college for which they were designed to prepare. The earliest laws did, indeed, provide both for elementary schools and for secondary schools, but those provisions included no plan or suggestion for articulation between them. It was not until the ~~rise of the~~ high school in the second quarter of the nineteenth century that there developed any sort of organized articulation between the two departments, though it should be noted that various comprehensive schemes for state systems of education which provided for a well-articulated system of elementary and secondary schools had been proposed and in part adopted before that time.

The Latin grammar school was confessedly designed solely to prepare boys for college and hence in part reflected the mark of social distinction found in European secondary schools of the period. Such boys did not attend the "*common* schools." It was only with the establishment of the high school, which aimed to provide secondary education for boys and girls who did not intend to go to college, that boys and girls who had gone to the *common* schools were provided with a means of secondary education. The need for articulation then became important. Thus the Boston English Classical (High) School was established "with the design of furnishing young men of the city who are not intended for a collegiate course of study *and who have enjoyed the usual advantages of the other public schools* with the means of completing a good English education."

The first high-school law in the country (Massachusetts, 1827) made no provision for the articulation between the secondary school and the elementary school but rather interfered with any close articulation by providing for a certain amount of elementary education in the high school proper. This led to a considerable amount of confusion which persisted for several years. However, the law did allow the local school committees to determine the regulations regarding the qualifications for admission to the high school and in the larger and better school systems there soon developed certain standards for admission to the high school which regularly involved satisfactory completion of the elementary school studies. This is specifically so stated in the report of the school committee of Worcester (Massachusetts) as early as 1844, but the standard had in fact been established rather generally in practice before that. The transfer was regularly made on the basis of examinations which were made quite formal, even to the extent of printing the examination questions. Nevertheless the greatest confusion between elementary and secondary schools was found until well into the last half of the nineteenth century, a condition which may be appreciated from the fact that, while there were certainly not more than eighteen high schools in Massachusetts in 1840, out of 304 towns reporting at that date, 104 claimed to offer algebra in their schools, 181 claimed to offer natural philosophy (physics), 116 mental science, 41 chemistry, and various other subjects belonging to the secondary school curriculum — some of them required by law as high-school subjects.

In this connection we must not fail to note the lack of well-graded elementary schools in this country until well on into the second half of the nineteenth century. In many States the "district system," whereby a large number of small and to some degree independent political districts, with corresponding education units (school districts), militated strongly against the development of well-graded schools. This undoubtedly had its influence in delaying the articulation of elementary and secondary schools in the United States, and particularly in New England.

From these facts it is clear that the present form of articulation between elementary and secondary schools in the United States is of relatively recent development and represents the result of attempts to bring into relation two institutions, which had grown up more or less independently. The present situation is the result of a gradual growth rather than a system logically developed in theory and applied directly through legislative or administrative action, the result of an evolution, not the result of a logically constructed organization.

106. Practice in foreign countries. An examination of systems of education in foreign countries discloses a number of facts of interest in connection with the relation between elementary and secondary education. Among those facts may be mentioned the following.

(1) In many foreign countries, e.g., Germany and France, the division of schools is based on the groupings of pupils (social and economic) rather than on the basis of school progress, the "higher schools" including both elementary

and secondary education in the American sense of those terms.

(2) In such countries there is no definite point at which one can say elementary education ends and secondary education begins. In whatever school a boy or girl enrolls he proceeds without abrupt transition from grade to grade or

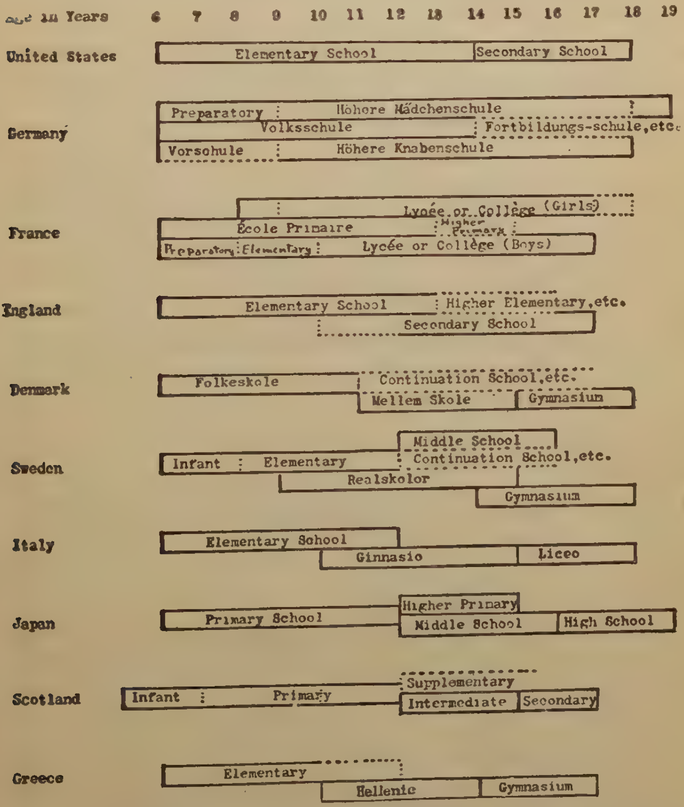

FIGURE U. ILLUSTRATING THE RELATION OF VARIOUS SCHOOLS IN DIFFERENT FOREIGN COUNTRIES from division to division. Nothing could be more misleading than the statement commonly made that the German boy begins his secondary education at the age of nine when he enters the "higher school," or that the French boy begins his secondary education at the age of ten when he enters the *lycée* or *collège*. In both cases elementary education merges into secondary education (in the American sense of both terms) so gradually that it is quite impossible to dissociate the two. This continuity and gradualness of educational progress is in fact one of the outstanding characteristics of German and French education.

(3) Subjects which are confined to secondary-school study in America are begun at a much earlier stage in most foreign countries, e.g., in the "higher schools" of Germany and in the French *lycée*.

(4) Some amount of differentiated education is provided earlier in Germany and France than in America — in Germany at the age of nine and in France at the age of ten.

Some of these facts will appear more clearly from the diagram illustrating the relation of various schools in different countries. (Figure U.)

III. THE PRESENT STATUS OF THE ARTICULATION BETWEEN ELEMENTARY AND SECONDARY EDUCATION IN THE UNITED STATES

107. The eight-four-system. In discussing the present status of articulation between elementary and secondary education in this country the normal situation will be considered as that in which a four-year high-school course is sequentially related to an eight-year elementary-school course. In some localities, especially in New England, the elementary-school course comprises nine grades, but in such cases younger children enter the first grade of the school, which is to be considered in some respects as taking the place of a kindergarten grade, and the relation of the elementary school to the high school is not seriously affected. High schools with courses shorter than four grades are numerous, constituting approximately one third of all high schools in the country and enrolling about one tenth of the total number of high-school pupils. With the exception of high schools established in recent years in the form of junior-senior high schools, or as six-year high schools (to be considered separately below), variations from the four-grade high school are due to their situation in sparsely populated districts and are mainly of the partial high-school type, considered as incomplete and preparing pupils for the completion of their courses in other nearby high schools. Their number is constantly decreasing as consolidation improves, and they involve no important separate problem affecting the matter of articulation.

108. The age of pupils transferred. Theoretically pupils in the last grade of the elementary school are about thirteen or fourteen years of age and those of the first grade of the high school are about fourteen or fifteen years of age. It has already been pointed out that there is a great amount of overlapping between grades in the chronological ages of pupils in any school system. In the majority of school systems pupils twelve, thirteen, or fourteen years of age will be found scattered all the way from the first grade of the elementary school well into the high school and pupils fifteen, sixteen, even seventeen years of age will be found in almost every grade from the lowest to the highest. Thus it appears from the data presented in Table III that in the cities considered 45.2 per cent of all thirteen-year-old pupils were found located below the seventh grade, 46.2 per cent of all fourteen-year-old pupils below the eighth grade, 45.1 per cent of all fifteen-year-old pupils below the first grade of the high school. In many school systems there are more fifteen-year-old pupils in the elementary school than in the high school.

The large number of over-age pupils found in the elementary school raises some serious questions concerning methods of promotion in the later grades of that school. The problem will be considered at greater length in later sections dealing with the junior high school. It may be suggested here, however, that the practice hitherto obtaining of retaining pupils chronologically, physiologically, and socially mature, in the lower grades of the school system and making the complete accomplishment of prescribed amounts of elementary-school work the sole criterion for the admission of pupils to other forms of education is a practice harmful both to the school and to the pupils. Pupils who are more mature and who can secure greater benefit through other forms of education than those usually provided in the elementary school as at present organized must, wherever possible, be provided the opportunity to engage in such education as they can do rather than be required over and over to engage in forms of education for which they have already manifested their inability. Suggested means for accomplishing this reform will be considered in later sections.

109. The pedagogical age of pupils transferred. To describe the stage of pedagogical development of pupils making the transition from the elementary school to the secondary school is a practical impossibility. To state that the pupils have progressed through eight grades of the elementary school having performed the duties required by the course of study and the administration with a certain degree of success is to afford but little evidence of the ability and achievement of such pupils. We know that the pupils have met the minimum requirements of the elementary school in reading, writing, arithmetic, geography, history, nature study, drawing, etc. We know that they have been subjected to certain forms of social education and to certain forms of discipline. We know that each of those factors has had its measure of effect in determining the nature of the children entering the secondary school. Measures of the definite status of the mental ability, of interests and attitudes, even of achievement, are almost completely lacking. Until such measures are supplied we must rest content in describing the previous training of pupils entering the secondary school in general terms indicating that they have received such training as is afforded by eight years of education in the elementary schools, under the conditions obtaining there, and have acquired a certain amount of facility in the employment of such tools of education as are involved in language work, numerical calculation, a certain number of facts of geography, nature study, history, etc., and certain attitudes toward the work of the school and toward society. That the pupils coming to the secondary school from the elementary school should represent even a fairly homogeneous group in achievement is not to be expected. Still less is it to be expected that the group will be homogeneous in capacity and ability. The same amount of "exposure" to the educational forces of the elementary school does not decrease original differences in capacity nor in achievement: rather it tends to increase such original differences, and one may confidently expect to find among pupils entering the secondary school after essentially the same amount and form of training in the latter, differences fully as great as those exemplified in Tables XXIII and XXIV.

110. Evidences of defects in articulation. For a number of years it has been recognized that defects exist in the articulation between elementary schools and secondary schools in the United States. Transition from one institution to another or from one division of the same institution to another must always involve the necessity for a certain degree of readjustment to changed conditions. The more different the two institutions or divisions the greater is the degree of readjustment necessary. Important differences are found between the elementary-school situation and the high-school situation, and the pupil called upon to make the change from one division to the other is required to make important and difficult readjustments. Some of those readjustments necessary deserve attention.

(1) The transition from the elementary school to the high school ordinarily involves the breaking up of established social groups among pupils who have been associated for some years and the establishment of new social groups. The resulting readjustments are as difficult in many cases as those which face the college freshman or the boy whose family moves to a strange town or district.

(2) The transition from the elementary school to the high school ordinarily means a transfer from one institution to another quite different, to one in which almost every phase of the organization and administration is radically different to those obtaining in the institution to which he has become accustomed. The resulting readjustments necessary are by no means easily made and sometimes the necessity for such readjustments is not recognized until extensive damage has been done to the boy or girl.

(3) The pupil on passing from the elementary school to the high school ordinarily passes from a situation in which practically all his study in any one grade (or even several grades) has been under the direction and guidance of a single teacher who has learned to know him in all his activities — to know the whole child — to a situation in which his activities are divided in such a way as to involve a number of different individuals as teachers and guides, no one of whom knows the pupil as a whole and can coördinate his various

activities connected with the school work. Such an abrupt transition from one situation to a far different one involves an extremely difficult readjustment on the part of the pupil. This situation, however, is rapidly being remedied in part by extending some forms of departmental teaching down into the eighth, seventh, or even the sixth grade of the elementary school, and, when such departmental work is gradually introduced and its amount increased grade by grade, the transition from the one school to the other permits a gradual readjustment. In 1913 the United States Bureau of Education sent out a questionnaire to superintendents in cities of 5000 population or over, of which there were 1245 enumerated in the census of 1910. Of 813 replies received, 461 reported departmental teaching in the elementary school in some form in the later grades. The complete data summarized were as indicated in the following table.

TABLE CV *

	Yes	*No*	*No data*
Is departmental teaching in operation?	461	352	...
Is the percentage of failures less?	240	78	143
Do a larger percentage enter the high school?	250	61	150
Are pupils better able to do high-school work?	302	34	125

* *Report of the United States Commissioner of Education* (1913), vol. I, pp. 139–40.

(4) Transfer from the elementary school to the secondary school commonly means a noticeable change in the character of studies. Those of the last grades of the elementary school are almost exclusively subjects which have been studied for many years and are familiar to the pupil in their general associations because they are but different phases of such subjects as arithmetic, language, geography, and the like. On entrance to the high school the pupil is confronted by a group of studies nearly all of which are unfamiliar in character or attacked from a viewpoint and by methods which are unfamiliar. Obviously new subjects

of study must be encountered by the pupil in his progress through the school. The difficulty lies not in the necessary introduction of new studies but in the fact that they are encountered *en bloc* in the first grade of the high school. The necessity for abrupt adjustment to this group of new subjects is a severe strain on the pupil. This is further emphasized by the fact that the increased responsibility for undirected study and the removal of conditions favoring a coördination of studies and habits of study make a sudden demand for self direction for which previous provision has not been made. Finally, when to these factors is added a third — the responsibility for choice and election of studies and curricula — the difficulties of adjustment and orientation are tremendously enhanced.

(5) Teachers in the elementary school regularly have received their training in the normal school. Teachers in the high school regularly have received their training — such as it is — in the college. The former have received a professional training which has emphasized method and the pupil. The latter have received no professional training in most cases and in their higher education have tended to become specialists in subject matter. In the elementary schools only 17.6 per cent of the teachers are men and it is not by any means an exceptional case for the boy or girl to reach the high school without ever having come into contact with a man as his teacher. In the high school on the average 43.6 per cent of the teachers are men and sooner or later the high-school pupil is to have nearly one half of his work and training under men teachers. Ordinarily the change is not so great as that implied by the figures since the majority of men teachers in the elementary schools are found as teachers in the later grades of those schools. The change is not without importance, however, for pupils of either sex.

(6) As a result of the factors mentioned in the two paragraphs preceding important differences are found in the methods of teaching employed in the elementary and secondary schools. The abrupt changes in the methods of teaching employed constitute one more factor demanding readjustment on the part of the pupil entering the high school for the first time.

(7) Closely related to this factor is the fact that methods of discipline and methods of treating pupils differ quite widely in the elementary school and the secondary school. As children mature forms of discipline and of treatment must and should change. No justification can be found, however, for the sudden and abrupt change within four months from the maternalism of the elementary school to individualism of the secondary school. When conditions call for such a change the pupil is bewildered by the great readjustment necessary.

(8) Finally we may note that the whole atmosphere in the high school differs from that of the elementary school. The thousand and one forms of readjustment demanded of the boy or girl entering the high school for the first time postulate a capacity for adaptation not always found.

In general we may draw one important conclusion from all these forms of readjustment involved — that the present form of articulation between elementary and secondary education violates the most important laws of unity and continuity demanded by the unitary, continuous, and gradual development of children. It is to be noted that every one of the changes mentioned is necessary. The danger lies in the fact that all those changes come at the same time and are sudden and abrupt, so that the difficulties of adjustment are cumulative.

III. **Retardation and elimination as evidence.** While the phenomena of retardation and elimination are complex and difficult of interpretation, they may afford some evidence of the difficult readjustments which face the pupils when they pass from the elementary school to the secondary school. Figures for retardation indicate a large proportionate amount of non-promotion in the first year of the high school and in the majority of high schools it is recognized that the first grade is the critical point in the school. Failure there is not only greatest but also more likely to result in discouragement and withdrawal from school.

In Chapter IV it was pointed out that the greatest proportionate amount of elimination is found in the first grade of the high school or between the first and second high-school grades. The interpretation of that fact is not altogether clear, but we are at least safe in saying that, so far as the evidence goes, it would corroborate the belief that the difficulties of adjustment facing the pupil on entrance to the high school result in failure, discouragement, and withdrawal.

In this connection it may be noted that malarticulation between the elementary and secondary schools is evidenced not only by the fact that pupils entering the high school fail and leave in large numbers, but also by the fact that large numbers of pupils leave school at the close of the elementary period. In other words the high school not only fails to retain pupils entering, but it also fails to attract many pupils who should enter.

112. Instruction in later elementary-school grades. Directly or indirectly the character of the instruction provided in the later grades of the elementary school seriously affects the articulation between that school and the secondary school. Some of the factors here involved have already been considered. It remains to point out that the unsatisfactory education provided in the seventh and eighth grades tends both to eliminate pupils in those grades and to discourage them from proceeding into the secondary school. In the following table are presented figures indicating the average number of minutes per week devoted to various elementary-school studies in the seventh and eighth grades of about fifty typical cities in the country.

TABLE CVI *

Studies	*Grade 7*	*Grade 8*
Reading	98	97
Language	134	142
Spelling	52	51
Penmanship	39	37
Arithmetic	140	142
Geography	98	76
History	91	117
Science	45	57
Drawing	50	49
Music	45	44
Manual training	72	74
Physical training	38	39
Opening exercises	31	31
Recess	66	66
Miscellaneous	78	87

* On this whole question see the *Fourteenth Yearbook of the National Society for the Study of Education*, Part. I. Table from p. 26. See also *Sixteenth Yearbook*, Part I.

Reading, language, spelling, penmanship, arithmetic, geography engage pupils during more than sixty per cent of their recitation time in the seventh and eighth grades. In many cases all studies of the elementary school are of a highly formal character, containing much obsolete and useless material, and including a great amount of review work.[1] Few elementary schools provide any opportunity for pupils to vary their study in any appreciable degree by election of subjects. Shorn of useless material and with a reduction of reviews the elementary-school course in the seventh and eighth grades could better meet the needs of education and of articulation.

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[1] On the review work of those grades see Hill, C. M., *Missouri State Normal School Bulletin* (1915), no. 3.

IV. REFORMS IN THE ARTICULATION OF ELEMENTARY AND SECONDARY EDUCATION

113. Further objections to present conditions. In the preceding section were pointed out evidences of a maladjustment of elementary and secondary education in this country because of the difficulties involved in the transition from the former to the latter. That "gap" between the two divisions is not, however, the sole objection which has been raised against the present form of articulation between the two schools. More fundamental objections are to be found. They may be grouped under three general heads: (*a*) psychological considerations, with special reference to the factors of development with maturity and the distribution of individual differences among pupils; (*b*) social and economic considerations, with special reference to the factors of economy of time and money in education, prevocational education and the differentiated needs of society, elimination and retardation; (*c*) administrative considerations. Needless to say, these factors are all closely interrelated. However, for purposes of analysis they may be considered separately in the following sections.

114. Psychological considerations. Two important psychological factors affect the problem of articulation between elementary and secondary education, one involving the adjustment of the different divisions of the educational system to the development of children in mental traits, the other involving recognition of the existence and distribution of individual differences among pupils and the adaptation thereto of the education afforded.

(*1*) *The factor of development with maturity:* For some time the theory has obtained in American education that a rather sudden and abrupt change from elementary to secondary education is justified on the assumption that the development of children with maturity is saltatory and that at adolescence particularly a marked change takes place in the boy or girl which justified a correspondingly marked differentiation between elementary and secondary education. From the material presented in Chapter II it would appear (*a*) that the theory of gradual development seems more correct than the theory of saltatory development; and (*b*) that, even on the assumption of a theory of saltatory development for individuals, among groups of pupils variability is so great and the influence of other factors so strong that points of abrupt transition between any two successive divisions of the system of education are quite unjustifiable. Essential continuity and gradual change should mark the articulation between elementary and secondary education whether a theory of saltatory development or a theory of gradual development is assumed.

In this connection attention may be recalled to the facts disclosed by figures in Tables XI to XVIII. Those figures indicate that as our school system is at present organized pupils in grades 1–6 are predominantly immature physiologically, in grades II–IV (high school) pupils are predominantly mature physiologically, and that the stage from the seventh grade of the elementary school to the first grade of the high school, pupils are in a markedly transitional period as far as the factor of pubescence is concerned. At the age of twelve less than five per cent of the pupils are post-pubescent, and the age of sixteen more than four fifths are post-pubescent. Ages thirteen to fifteen mark the transitional period.

(2) *The factor of individual differences*: While the factor of individual differences is involved in all departments and at all stages in education, it fails to receive recognition in important respects until the stage of secondary education begins. In the majority of school systems under existing

conditions any sort of adaptation of courses, studies, and methods of teaching to the differentiated capacities, interests, and needs of boys and girls is deferred to the beginning of the high school where pupils are on the average approximately fourteen or fifteen years of age. The psychology of individual differences indicates that this date is too late and that provision should be made earlier in the school system for the adaptation of the work of the schools to the differentiated capacities, interests, and needs of pupils as well as to the differentiated needs of society. There can be little doubt that failure to meet this demand in the past has led to ineffective work on the part of the school, has hampered the administration of the school system, and has contributed greatly to the forces of retardation and elimination.

115. Social and economic principles involved. Closely related to the factors considered in the preceding section, and certainly no less important, are those which arise out of certain social and economic considerations.

(*1*) *Economy of time in education*: Within the past half-century or less the ages at which the successive stages of education are begun and are completed have gradually been extended upward until serious questions have arisen concerning the economy of time in our educational system. When we consider the system of education as a whole, we find that those who enter professional careers do so at a relatively late age when compared with their fellows in other countries. Likewise, when we consider the attainments of graduates of our secondary schools and colleges we find that they are not equal to the attainments of students in other countries with respect to the amount of time devoted to their education. Recognizing those facts many American educators have turned their attention to the problem of economy of time in our schools, their attention focusing on the length of the elementary-school course (with special reference to the last two grades of that school), the length of the secondary-school course, and the form of articulation between the two. Among the many suggested changes that recommended by the Committee of the National Council of Education on "Economy of Time in Education" perhaps best illustrates the problem. That committee has presented a provisional time schedule in which the articulation between the various divisions of the system of education would be: elementary education, 6–12 years; secondary education (two divisions — four years and two years), 12–18; college, 18–20 or 16–20; university (graduate and professional schools), 20–24.[1] It is to be noted that the most important reform herein suggested is one involving the last two grades of the elementary school which have long been recognized as the part of the school system most open to criticism on the ground of the questionable character of the work done there.

(2) *The factors of elimination and retardation:* If the problem of economy of time in education and the resulting problems affecting the general spread of educational products were confined to those completing the high-school course or higher courses, its importance, while great, would not assume the proportions which it otherwise assumes. However, figures previously presented in Tables LV to LVII indicate that while approximately ninety per cent of the children in the country remain in school up to the age of twelve or thirteen and approximately four fifths remain in school up to the age of fourteen, only a little over two thirds remain in school up to the age of fifteen, about one half up to the age of sixteen, only a little over one third up to the age of seventeen, and less than one quarter up to the age of eighteen. With respect to the grade reached more than three quarters of the pupils who enter reach the sixth grade

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[1] Bureau of Education Bulletin (1913), no. 38, p. 10.

and about one half complete the work of the elementary school. About one third only, however, enter the first grade of the high school, and about one eighth or one ninth complete the high-school course. The resulting social and economic loss (positive or negative) is tremendous. For the boy or girl who leaves school at the close of the sixth grade little has been provided along the line of education specially adapted to meet his special needs in life. For those who remain through the seventh and eighth grades the same is true though (theoretically at least) a further general education has been provided. For those who fail to reach the high school (two thirds of those entering the school) any form of differentiated education adapted to meet their special needs, or in fact to discover their special needs, is the exception rather than the rule in our public schools. This is a situation to be accepted as a fact and the factors of elimination and retardation must be considered as legitimate grounds for so modifying our educational system as to provide a more adequate training for the large number of children who leave school early. One way of accomplishing this is to provide for more appropriate forms of education in what are now the seventh and eighth grades, with the expectation that thereby those at present eliminated in those grades may be afforded a more efficient form of education and the hope that by providing for differentiated courses to some extent in the last part of the elementary school pupils may be encouraged to carry their education further.

(3) *Vocational and prevocational education:* The fact that such a large percentage of boys and girls leave school before entering the high school and enter the field of industry without definite aim and with no conception of the job, trade, or work which they enter, has led to an emphasis by some educators on the necessity of certain forms of vocational or prevocational work in the last grades of the elementary

school, coördinated where possible with such work in the secondary school. Emphasis attaches here also to the fact that the close of the present elementary school comes at the close of the period of compulsory education set by law in most States and the undoubted fact that elimination in the seventh, eighth, and first-year high-school grades is closely correlated with the close of the compulsory attendance period.

116. Administrative factors involved. Numerous factors involved in the administration of the schools are of importance in connection with reforms of the articulation between elementary and secondary education. These are of such varied character that they defy generalization, but among them may be mentioned several factors, for the most part related to the considerations previously adduced. (*a*) It has long been recognized that certain reforms are desirable in the studies of the seventh and eighth grades. Such reforms include the elimination of some obsolete and useless material, the reduction of review work, and the reorganization of studies so as to include educational means more suitable for the activities of lives which the pupils will later lead. Much pruning is desirable in the studies of the seventh and eighth grades as at present organized.[1] (*b*) The work of the high school under existing conditions is crowded, especially for those pupils who are destined to enter college. An earlier beginning of some subjects now confined to the secondary-school program would do much to relieve the congested work of the high school for some groups of pupils. (*c*) The number of retarded and over-age pupils now found in the lower grades of the elementary school demands attention and calls for some form of reorganization which will permit those pupils to enter on work which they can do rather than perpetually review work for which they have manifested their ineptitude. This means provision for some different forms of education in the later grades of the elementary school than those now found there. (*d*) It is imperative that some amount of differentiated work be provided in the seventh or eighth grades. This cannot be accomplished under the existing organization. The adaptation of school work to the needs of individual differences in capacities, interests, and probable future activities on the part of pupils is economically impossible where small groups of pupils are involved. If differentiated work is to be provided, for example in the eighth grade, pupils of that grade must be assembled in larger groups than are now commonly found in separated elementary schools. Differentiated work quite impossible in the small school becomes feasible in the large school. (*e*) Provision must be made to afford more contentful studies in the later grades of the elementary school both for the sake of those who must leave school early and for the encouragement of those who can be led to continue their education into the secondary school. (*f*) The acceleration of brighter pupils is at present handicapped by the methods of promotion regularly found in the elementary school. Promotion by subjects rather than by grades must be instituted in the seventh and eighth grades. (*g*) In many larger communities crowded high schools offer serious social and administrative problems. A group of junior high schools articulated with senior high schools would do much to relieve the crowding of pupils in a central high school. (*h*) In rural communities high schools of the present type are frequently uneconomical and sometimes impossible. In many such cases the earlier beginning of some forms of secondary education would make possible some degree of acquaintance with secondary-school work for many children who otherwise would go without contact with any other school influences than those now found in the elementary school.

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[1] Cf. Part I of the *Fourteenth Yearbook of the National Society for the Study of Education*, "Minimum Essentials in Elementary School Subjects." Cf. also *Sixteenth Yearbook*, Part I.

V. The Junior High School

117. The six-grade course of secondary education. The present movement toward the development of a six-grade course of secondary education had its beginning in the last decade of the nineteenth century. Certain suggestions made by President Eliot at the meeting of the Department of Superintendence in 1888 called attention to defects in our school system, primarily affecting the relation between the high school and the college, but incidentally affecting the relation between elementary and secondary schools. In 1893 the "Committee of Ten" introduced in its report certain recommendations involving the articulation between elementary and secondary education. Of particular interest is that portion of the report which states:

> In the opinion of the Committee, several subjects now reserved for high schools, — such as algebra, geometry, natural science, and foreign languages, — should be begun earlier than now, and therefore within the schools classified as elementary; or, as an alternative, the secondary school period should be made to begin two years earlier than at present, leaving six years instead of eight for the elementary school period. Under the present organization, elementary subjects and elementary methods are, in the judgment of the Committee, kept in use too long.[1]

Numerous suggestions were made for a readjustment of the grades of the school system subsequent to the report of the "Committee of Ten." In particular the "Committee of Five" of the National Education Association in 1907,

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[1] *Report of the Committee on Secondary School Studies*, p. 45 (Bureau of Education edition).

1908, and 1909 recommended an equal division of the grades between elementary and secondary education. In 1902 the "Pettee Committee" recommended the following scheme:[1]

Division	*School*	*Grades*	*Ages*
Primary	Lower or Primary School	1– 3	6– 9
	Upper or Grammar School	4– 6	9–12
Secondary	Lower High School	7– 9	12–15
	Upper High School	10–12	15–18
Tertiary	College or Technical School	...	18–21
	Professional or Graduate School	...	21–24

Up to 1910 the development of six-grade high schools was slow, only about twenty-two cities in that year reporting six-year high-school courses of study to the Bureau of Education. By that time, however, the movement toward the reorganization of the last grades of the elementary school and of the secondary school had assumed a somewhat different form which marked the beginning of the junior high school or intermediate school.

118. The junior high-school movement. While numerous attempts had been made previously in different parts of the country to reorganize the work of the late grades of the elementary, the real beginning of the present junior high school or intermediate school movement is probably to be found in the reorganization of the school systems in Columbus, Ohio (1908), Berkeley, California (1910), Concord, New Hampshire (1910), and Los Angeles, California (1911). Reorganization developed rapidly thereafter in several lines. Thus of cities included in an incomplete list making returns to the Bureau of Education in 1914–1915, cities reported school systems organized in such combinations of elementary, intermediate, and high-school grades as 6–1–5, 6–2–4

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[1] For that report in condensed form and with proposed curriculum attached cf. Hanus, P., *A Modern School,* pp. 105–09.

(thirty-five cities), 6–3–3 (twenty-six cities), 6–4–2, 5–3–4.[1] As a result of his study Douglass reported in 1916 that of 184 school systems, 11 were organized on a 5–3–4 plan, 77 on a 6–2–4 plan, 64 on a 6–3–3 plan, 10 on a 6–6 plan, and 22 according to various other plans.[2] On the whole the plan which seems likely to receive ultimate recognition is the six-grade elementary school, followed by a junior high school of three grades, followed by a senior high school of three grades. Of systems now organized on the 6–2–4 plan many are to be considered as in a stage of transition. While the present is noticeably a period of experimentation and such reorganized systems of education must be considered as on trial, there is evidence that the movement is destined to develop rapidly within the next decade. Its status is at present difficult to determine both because of the lack of fixed standards and because the rapid changes which are taking place make it difficult to secure accurate data. Reports received by Douglass indicate that between three and four hundred junior high schools or intermediate schools were claimed to be in operation in 1916.[3]

119. The purposes of the junior high school. The purposes of the junior high school organization are to correct the defects now found in our school system. They involve, therefore, the following factors.

(1) Provision for a better coördination and articulation between elementary and secondary education and provision for gradual transition from earlier to later grades in the school system. This demands: (*a*) the close relationing of each successive grade with the preceding grade as far as teaching material and teaching method are concerned;

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[1] Briggs, T. H., in *Report of the United States Commissioner of Education* (1914), vol. I, pp. 135–57.

[2] Douglass, A. A., "The Junior High School," *Fifteenth Yearbook of the National Society for the Study of Education*, part III, p. 88.

[3] Douglass, A. A., *op. cit.*, p. 27.

(*b*) gradual change from the one-teacher plan of the elementary school to the many-teacher plan of the secondary school; (*c*) gradual change from largely supervised work in the earlier grades to more independent work involving initiative, self-reliance, and responsibility in the later grades; (*d*) the gradual introduction of new subject matter and its relationing to old subject matter; (*e*) the gradual introduction of "election"; (*f*) gradual change in teaching methods and in methods of treating children.

(2) Provision earlier in the school system to adapt the work of the school to individual differences among pupils in capacities, aptitudes, interests, and future activities, as well as to the differentiated needs of society. This demands: (*a*) the earlier introduction of some differentiated studies for different groups of pupils; (*b*) promotion of pupils by subjects rather than by grades; (*c*) increased flexibility in the administration of education in the intermediate grades; (*d*) provision for the introduction of some forms of instruction which may give pupils an opportunity to explore and test out their capacities, aptitudes, and interests; (*e*) provision for some forms of educational diagnosis and direction; (*f*) recognition of the needs of those leaving school early; (*g*) provision for economy of time in the case of brighter pupils.

(3) Recognition of the importance of the factors of retardation and elimination. This involves: (*a*) reorganization of the subject matter of the present seventh and eighth grades so as to provide a more contentful and effective form of education for those who must leave school early; (*b*) the introduction of some prevocational education for those pupils; (*c*) provision for the reduction of retardation and elimination by improved methods of controlling progress through the grades; (*d*) the encouragement of larger numbers of pupils to continue their education into the senior high school.

(4) Reorganization of teaching materials and teaching methods. The belief is growing stronger that subjects of study in the junior high school should be organized primarily with reference to the capacities and needs of the pupils and with reference to their activities in life after the school, and not primarily in terms of the logical organization demanded by the subject considered as a logically arranged field of knowledge. The study of subjects as logically organized units or fields of knowledge should be reserved for the work in the senior high school.

120. Difficulties to be met. No such comprehensive reorganization as that contemplated by the junior high school movement can be accomplished without involving many readjustments and difficulties at least temporary. Many of those difficulties may be dismissed at once on the ground that they are but temporary problems incidental to any effective form of reorganization. Such are those arising in some states from established laws or regulations affecting the distribution of public funds, the certification of teachers, taxation, etc., the necessity of readjusting college entrance requirements in terms of reorganized education, the bickerings and political maneuvers of disgruntled principals and teachers, wranglings over the location of schools, etc. When these objections to the establishment of junior high schools have been dismissed, however, there remain at least four important problems to be considered.

(1) If all pupils were destined to continue in school throughout the full twelve-year course and if the exigencies of administration made it possible, it would be advisable to have one undivided system consisting of grades one to twelve. Neither of those assumptions hold, however, and it is probable that they never can hold. Divisions in the school system are made necessary by the exigencies of administration. They are to some extent made desirable by the fact

that many pupils leave school before the complete course is covered. The division of the school system into three departments as contemplated by the junior high school plan involves the danger of creating two critical points in the school system instead of the one now found between elementary and secondary education. Great care is necessary that evils now found at the one point of division may not be increased by the creation of two points of division. The second divisional point in the school system (between the junior and senior high schools) will doubtless improve the retention of pupils up to the age of fifteen or sixteen. It will doubtless also have some tendency to encourage elimination at that point. Whether or not the general stimulus provided by its organization will encourage retention beyond that limit so as to outweigh a certain amount of elimination fostered there remains to be seen. Experience to date would appear to give an affirmative answer to this problem.

(2) The fundamentally important point has been raised by Bagley[1] that while "the advantages are clearly on the side of a 'six-six' organization from the point of view of administrative expediency and to a large extent from the standpoint of educational theory" the early introduction of the factor of differentiation may serve to limit the factor of integration providing "a common basis of certain ideas and ideals and standards which go a long way toward insuring 'social solidarity' — *a basis of common thought and common aspiration which is absolutely essential to an effective democracy.*" This objection to the reorganized system is a serious one if valid. Two facts, however, suggest that Bagley's position is open to question. The first is that a basis of common thought and common aspiration must be retained in the junior high school under any circumstances. The second

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[1] Bagley, W. C., "The 'Six-Six' Plan," *School and Home Education*, vol. XXXIV, p. 3.

is that the integrating function of education and the differentiating function of education must be considered supplementary and not antagonistic. On this theory elementary education is not to be considered as being confined exclusively to integration, nor is secondary education to be considered as confined exclusively to differentiation. Nevertheless Bagley has called attention to a danger which must be avoided carefully.

(3) It is commonly estimated that the expense of education under the junior-senior high school plan will increase the cost of the schools. Of thirty cities reporting the cost of the junior high school instruction to the Bureau of Education, seventeen reported that the junior high school costs more *per capita* than the elementary school, seven reported that the cost was the same, and six qualified their answers. Comparing the cost with that of the high school, ten reported that it was the same, and twenty that it was less. On general grounds it has been estimated that the *per capita* cost will be between the present cost of elementary-school education and secondary-school education. On the surface at least this means added expense for the maintenance of the school system. It must be remembered, however, that a decrease in the amount of retardation, if brought about through the reorganization of the system, may altogether offset the added expense incurred. It must further be remembered that economy and efficiency may be attained by increasing both expense and returns for that expense, as well as by increasing returns for the same expense or decreasing expense for the same returns. A broader social and educational economy may well justify an extended financial outlay.

(4) Changes in the form of organization, changes in curriculum, changes in the form of administration, are all readily subject to the fiat of educational authorities. For reform

in the effectiveness of the school system, however, such arbitrary changes depend on the readiness with which instruction may be adapted to them. It is at this point that the greatest difficulties must always be found. The proposed reorganization includes the introduction into earlier grades of certain studies previously found only in later grades, together with other subjects of study which are relatively new in any department of public education. Around older subjects of study there has developed a body of teaching method, embodied in textbooks, incorporated in the theory and practice of teachers, and recognized as "standard" for pupils from one to three years older than those for whom subjects have been provided heretofore. Further, certain studies which it is proposed to put into the program of the junior high school have as yet no established body of teaching method or organization. When it is realized that it takes more than a generation to develop a body of method, to train teachers, and to standardize textbooks in any given field, it must be recognized that the changes in teachers, in methods, and in textbooks, necessary for real reform in the seventh, eighth, and ninth grades, constitute one of the greatest problems involved in the reorganization of the schools.

NOTE: Many factors involved in the relation between elementary and secondary education and certain factors involved in the junior-senior high school plan have already been considered in preceding chapters. All matters of programs, curricula, and organization are dealt with in Part III, especially in Chapters XX and XXI.

PROBLEMS FOR FURTHER CONSIDERATION

1. Compare the curricula of any related elementary and secondary school of about 1890 with the curricula of any such system after 1910.
2. Examine the curricula of elementary schools in different cities and compare the studies offered and the relative amount of time devoted

to each. (Cf. *Fourteenth Yearbook of the National Society for the Study of Education*, pp. 21–27, and *Fifteenth Yearbook of the National Society for the Study of Education*, part III.)

3. Compare the programs of study for boys from nine to fourteen years of age in the Prussian higher schools, in French secondary schools, and in the four last grades of the American elementary school.
4. Examine and criticize available data concerning the relative standing of pupils in the elementary and secondary schools. (Cf. references in bibliography following.)
5. Compare the relative advantages and disadvantages of the 8–4, 6–6, 6–3–3, 6–2–4 plans for organization of the public schools.
6. What would be the advantages and disadvantages of a single twelve-grade system without administrative or other divisions?
7. Compare and evaluate the curricula of the different junior high schools presented in *Report of the United States Commissioner of Education* (1914), vol. I, pp. 153–57. (Cf. also Douglass, A. A., in bibliography following.)
8. Assuming that the transition from elementary education to secondary education should be gradual, show how such specific factors as the introduction of subject matter, changes in teaching method, etc., might be arranged to contribute toward that end.
9. Consider the problem of the relation between integration and differentiation (common elements and diversified elements) in connection with the different divisions, actual and proposed, of the public school system. (Cf. Bagley, W. C., "The 'Six-Six' Plan," *School and Home Education*, vol. XXXIV, no. 4 (December, 1914), pp. 119–31, and Inglis, A. J., "The Socialization of the High School," *Teachers College Record*, vol. XVI, no. 3 (May, 1915), pp. 1–12 (205–16).
10. Assuming that the per-pupil cost of the junior high school would be approximately halfway between that of the elementary school and that of the high school, estimate the probable added cost of the reorganized school system on the supposition that retardation should remain constant; on the supposition that it decreased one third or one half; on the supposition that elimination should be decreased one third. (Cf. *Springfield, Illinois, Survey*, pp. 96–97.)
11. Consider the problems of teachers for the junior high school.
12. Consider the arrangement of the course of study in any one subject in a reorganized system of public schools.
13. Consider the problem of economy of time in education as affected by the articulation between elementary and secondary education. (Cf. Russell, W. F., *Economy in Secondary Education*.)

SELECTED REFERENCES

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CHAPTER VIII

SECONDARY EDUCATION IN RELATION TO HIGHER EDUCATION

I. HISTORICAL DEVELOPMENT AND PRESENT STATUS

121. **Early relations.** Until within a relatively recent period the articulation between secondary education and higher education (as represented by the college or university) has always been closer than the relation between elementary and secondary education. Such a situation was largely due to the fact that elementary education, especially in Europe, was conceived as appropriate for the lower classes, while both secondary education and higher education were designed for the more fortunate classes who had more leisure for education and more need of it in the leading position which they occupied in society. Hence the earlier secondary schools were conceived as schools whose most important function was preparation leading to higher education for professions, especially the ministry, law, and medicine, or for that degree of culture deemed suitable for the upper classes. This conception has always been dominant in European countries, was dominant in this country until a relatively recent period, and was not abandoned when the conception developed that the secondary school had other important functions in addition to the legitimate function of preparation for higher education. The essential forms of secondary education, which had developed when the main function of the secondary school was preparation for the college or university, continued to remain in force long after it was realized that other functions were involved.

The justification for this state of affairs was assumed to lie in the belief that the sort of training provided in preparation for higher education was that best suited also for all other activities in life, and as long as such a conception obtained little change was made in the general economy of the secondary school to differentiate the work of the school for pupils preparing for higher education and those who were destined not to enter higher institutions. The conception that the work of the secondary school should be differentiated to conform to the needs of various groups of pupils was a development in theory during the nineteenth century. In France, Germany, and America it was the central issue of a century-long struggle. Its fulfillment in practice is as yet by no means complete.

122. The Latin grammar school and the college. The recognized purpose of the Latin grammar school of the American colonies was preparation for admission to college. This appears from the law passed by the General Court of the Massachusetts Bay Colony in 1647 which provided for the education of boys "so far as they may be fitted for the university." What college preparation meant at that time and later is illustrated by the requirements for entrance to Harvard College in 1642:[1]

> When any scholar is able to read Tully (Cicero) or such like classical author extempore, and made and speake true Latin in verse and prose, *suo* (*ut aiunt*) *Marte*, and decline perfectly the paragigms of nounes and verbes in ye Greeke tongue, then may hee bee admitted to ye college, nor shall any claime admission before such qualifications.

Similar requirements of proficiency in Latin and Greek remained practically the sole requirements for admission to colleges throughout the colonial period, and the relation between college and grammar school did not change materially within that period. In Massachusetts the situation was absurd. By the law of 1789 and according to the census of 1790 about 113 grammar schools were required. According to the census of 1820 about 173 such schools were required. As late as 1825 the freshman class entering Harvard was only seventy-one, and probably not more than one hundred boys from Massachusetts entered college at all in any one year. Thus there were more schools required in the State than there were boys entering college in any one year.

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[1] Translation attached to the Latin version of *The Statutes, Laws, etc., of Harvard College*, College Book 1. Cf. Broome, E. C., *A Historical and Critical Discussion of College Admission Requirements.*

123. **The early academy and the college.** The academy in America in many cases originated for the distinct purpose of emphasizing the education of boys and girls who did not intend to enter college. It has ended by becoming the "preparatory school" *par excellence* and in some cases itself developed into a college. It is not to be supposed, however, that the academy did not provide for college preparation in its early days. In most of the early academies provision was regularly made for those who intended to go to college, and in time there developed a large number of academies which were designed to prepare pupils for particular colleges, frequently being officially connected with the college itself. Commonly separate courses were provided for those going to college and for those not going to college, so that in the academy first were developed differentiated courses later to be taken over in part by the public high school. It is not necessary here to emphasize the fact that many academies more or less encroached on the field of the college and in some cases became serious rivals of the poorer colleges.

124. **The public high school and the college.** The first high school established in the United States was established in order to provide secondary education for boys who were

not intended for college. For this reason it has sometimes been assumed that the public high school in its early days confined its attention to education other than for college entrance and neglected the latter. It is true that the English Classical (High) School of Boston was designed for the education of boys who did not intend to go to college and that it ignored college preparation. It must be remembered, however, that college preparation was already provided for in the Boston Public Latin School and that in Boston the English High School was established to supplement the work of the Latin School, not to replace it. Except in a few scattered cases where the old Latin grammar schools survived the newly established public high school provided secondary education both for boys who were going to college and for boys and girls not so destined. While it is true that the law which began the public high-school movement in Massachusetts (and in the United States) provided for two types of secondary schools, the lower of which did not provide an education adequate for admission to college, it is also true that such differentiation existed in the statutes only and that when a high school of any type was established it almost never failed to include in its curriculum those studies necessary for admission to college — Latin, Greek, mathematics, etc. Hence from its beginning the public high school has always included in its economy provision for preparing its pupils for admission to college. In fact not until within the past few decades, if even now, has preparation for college ceased to be the dominant factor affecting the character of the work done in the public high school.

The specific requirements for entrance to college as affecting the public secondary school will be considered more fully in later sections, but certain general conditions may be mentioned here. First, many studies once confined to the college curriculum have gradually backed down into the curriculum of the high school. Second, the general scope of the subject-matter of the academy and public high school has always far transcended the requirements for admission to college, and in the introduction of new subjects the high school has constantly anticipated the requirements set by the college. Third, the number of pupils attending the high schools has increased greatly and the number of pupils preparing for college has increased greatly, but the proportion of college preparatory pupils has constantly decreased. Fourth, the probable extent to which the public high school may go in organizing its system so as to provide specific preparation for college has assumed importance because of the difficulties attendant on the proper coördination of the work for various groups attending the high school and the necessity of consulting the interests and needs of the many who do not go to college as well as the needs of the relatively few who do.

125. **The rise of public State universities.** The establishment of State colleges and universities, particularly in the West and Middle West, did much to simplify and improve the relation between the secondary schools and colleges in this country. As long as colleges were private or semi-private institutions the articulation between secondary and higher education was determined by the more or less arbitrary requirements imposed by the college authorities. Confusion, imperfect articulation, and lack of uniformity were the natural results of such a situation. But with the rise of State colleges and universities considered as integral parts of a public system of education organically related to the secondary schools a new element was introduced and a closer coördination between the two institutions was ultimately required. The conception of a complete system of education, the parts of which should be closely articulated

with each other, was found in the first quarter of the nineteenth century and even before. Thus it found its way into the constitution of the State of Indiana adopted in 1816 providing for "a general system of education, ascending in regular gradation from township schools to a state university wherein tuition shall be gratis and equally open to all."[1] Nevertheless, it was not until the impetus of Federal aid was given to States by the Morrill Act of 1862 that the movement began in earnest, and it was not until the last quarter of the nineteenth century that its development noticeably improved the relation between secondary education and college education. Still more recent has been the development of municipal colleges which, within their limited fields, have aided the closer articulation of secondary schools and higher institutions.

126. The secondary school and the normal school. The relation between the secondary school and the normal school has always involved confusion. For a long period one of the important functions of the secondary school was conceived to be the training of teachers for the elementary school. Even at present it is by no means the exception to find teacher-training courses in the public high schools. In 1914–15 pupils were reported to be enrolled in training courses for teachers in certain public high schools of every State in the Union except Rhode Island, South Carolina, Nevada, and the District of Columbia. Such pupils in 1914–15 numbered 25,721 (3501 boys and 22,220 girls), of whom sixty per cent were enrolled in high schools of the North Central States. In Kansas nearly fifteen per cent of the girls enrolled in public high schools were enrolled in teacher-training courses. In many States the demand for elementary-school teachers has led to the introduction or retention of such courses largely on the grounds of expediency. It should be noted, however, that such a practice has dangerous tendencies in that it frequently leads toward educational in-breeding, results commonly in over-ambitious attempts toward higher education in the high schools, and frequently interferes with the proper development of normal schools by bringing them into competition with the public high schools.

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[1] Constitution of the State of Indiana (1816), art. IX, sec. 2.

As the public high school in some cases has encroached on the field of the normal school, so has the normal school in many cases encroached on the field of the public high school. In many States the normal school has occupied itself with education essentially secondary in character. Even at present the practice is by no means uncommon of admitting students to the normal school who have had no high-school education, or one to three years of high-school work. Where normal schools were essentially private institutions, as formerly in Pennsylvania, standards of admission were extremely lax and the normal schools frequently became actual competitors of the public high school for purposes of secondary education. The situation is thus described for Pennsylvania in 1910 by Holland:[1]

> The Pennsylvania State normal schools and the public high schools are to-day in direct conflict. In previous chapters it has been shown that a large number of the normal-school students belong to the high-school period, and their academic preparation is such that they should be attending the secondary schools in their own neighborhood. . . . Strange to say the normal-school principals as late as 1910 agreed upon a four-year course of study that possesses many characteristics of the ordinary high school and places their institutions in direct competition with the rapidly increasing public high schools.

As a general principle it may be stated that normal schools should be so related to the public secondary school as to receive its students therefrom and continue their education, directed along special lines appropriate to their later vocation, from the point at which the secondary school closes. Any departure from that principle must be considered as a temporary expediency to be abandoned at the earliest opportunity. As a corollary it follows that training courses for teachers should not have a place in the public secondary school except as a temporary expediency.

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[1] Holland, E. O., *The Pennsylvania State Normal Schools and Public School System*, p. 80. Cf. also *ibid.*, pp. 2, 37–54, 80–90.

127. The overlapping of secondary school and college. The curriculum of the public high school has always transcended the requirements of subject-matter set up by the colleges for admission and frequently has included subjects regularly included in the college curriculum. Likewise the college curriculum regularly includes subjects of study which are essentially of secondary-school grade, e.g., courses in foreign languages for beginners, elementary courses in the sciences, etc. Thus there is always a certain amount of overlapping in the curricula of the secondary school and college. In the average high school it would not be at all difficult to map out a one- or two-year "post-graduate" course which (with respect to the subjects studied and the amount of time devoted to them) would be quite comparable to possible freshman or sophomore courses in college.

For more than a quarter of a century occasional attempts have been made to extend the work of the high school upward so as to provide what might be called "graduate" work, more or less comparable to the earlier part of the college course. In certain cities, notably in Joliet, Illinois, such attempts met with success. It was not until 1907, however, that any comprehensive organization was attempted covering more than one community. In that year the State Legislature of California passed a law providing:

> The high-school board of any high-school district, or trustees of any county high school may prescribe post-graduate courses of

> study for the graduates of such high school or other high schools, which course of study shall approximate the studies prescribed in the first two years of university courses.[1]

The first city to take advantage of this opportunity was Fresno, which established such a post graduate high-school course in 1910. By March, 1915, more than twelve "junior colleges"[2] had been established in California, and about two thousand pupils were enrolled in post-graduate courses in that State. In other States a few similar institutions have been established in spite of the difficulties encountered in existing legal technicalities, lack of close coöperation on the part of colleges of the usual type, and the element of increased expense.

Claims for the values of the junior college are made:

> It offers peculiar advantages, first, to the student who cannot afford to live away from home; second, to the young and immature student who is not yet ready to cope with the problems incident upon life at a large university; third, to the student who has failed to get his recommendation for college but who, by faithful and consistent study, may prove himself ready for advanced work; and fourth, to the student who does not intend to enter college, but who desires to continue his study along certain lines.[3]

To these claims may be added the claims that increased proportions of high-school graduates may be encouraged to attempt appropriate forms of higher education and the claim that in the larger universities (especially State universities) work is being done at public expense in higher institutions with much higher cost that might better be done in junior colleges at much lower cost. Further it is urged that the large size of classes entering the first year of college or university work render impossible that degree of individual attention most desirable.

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[1] School Law of California (1915), p. 151.

[2] The use of the term "junior college" as here employed must be distinguished from its use as employed for certain institutions in Wisconsin, Missouri, and Virginia. Cf. *Report of the United States Commissioner of Education* (1914), vol. I, pp. 166–67.

[3] Announcement of the Santa Barbara (California) Junior College, quoted at p. 22 of *Report of the Commissioner of Secondary Schools*, California State Board of Education, 1914.

At present the movement must be considered as in the experimental stage. Numerous difficulties, especially lack of college and university coöperation, have interfered with its development. In all probability the dominant factor determining the growth and status of the junior college will be the increased financial outlay necessary. It should, however, be remembered that much of the increased expenditure on the extended high school will be offset by the reduced college expenditure.

128. High-school pupils entering higher institutions. Opinions frequently expressed concerning the number and proportion of high-school graduates going to higher institutions commonly err in one of two ways, either overestimating or underestimating the number of such pupils. In sections 42–43 figures have already been presented indicating the percentages of pupils in the various grades of the high school destined to enter higher institutions. From those figures it appears that those pupils constitute an important portion of the secondary-school population (one sixth of those who enter the secondary school, one quarter of those in the second year, one third of those in the third year, nearly one half of those in the fourth year, one half of those who graduate, and more than one quarter of all pupils in the high school at any one time). This group represents one of the largest roughly homogeneous groups of pupils in the public high schools. Nevertheless, it must be recognized that it represents a portion only, and by no means the largest portion, of the high-school population. More numerous and certainly not less important are those pupils who either will not complete the high-school course, dropping out after one, two, or three years of secondary education, or completing the high-school course, will not continue their education in school beyond that limit. While exact figures are not available whereby the relative proportions of those two general groups may be determined, the data presented in the following table indicate that the proportion has changed decidedly even within the past two decades.

TABLE CVII. NUMBER OF COLLEGE STUDENTS TO EACH 1000 HIGH-SCHOOL PUPILS 1893–94 — 1913–14 *

Periods	*College and university students*	*High-school pupils*	*College and university students to each 1000 high-school pupils*
1893–94	88,471	289,274	305
1903–04	128,063	635,808	201
1913–14	216,493	1,218,804	173

* Compiled from data given in *Report of the United States Commissioner of Education* (1914), vol. II, pp. 192, 409.

The changing population of the public high school has made imperative changes in its economy. In the past the relatively large proportion of pupils entering the high school who were destined for higher education and the somewhat definite and tangible goal set up for the education of those pupils in the high school, have determined the curriculum and general economy of the secondary school. Within recent years the increased proportion of high-school pupils not destined for higher education and the formulation of more definite and tangible aims for the education of those pupils, have demanded the subordination of college-admission functions to more diversified aims affecting the larger proportion of secondary-school pupils. To a certain extent conditions have been practically reversed. The former problem involved the question of how the public secondary school might best be articulated with higher education: the present problem involves the question of how the higher institutions may best be articulated with the public secondary school. The former theory that that kind of secondary education which was best fitted to prepare pupils for college was also well fitted to educate pupils not so destined is being supplanted by the theory that secondary education has its various functions to perform and higher education must take its origin at the point where the secondary school leaves off.

Assuming that the preparation of pupils for admission to higher institutions is a legitimate function of public secondary education, but that such propædeutic function is subordinate to more general functions of secondary education, the problem of the relation of secondary education to higher education becomes a question largely of the amount and flexibility of college entrance requirements and the methods by which high-school graduates are selected for admission to the college or other higher institution. These factors are considered in some detail in following sections.

II. College Admission Requirements

129. Early requirements and changes. The earliest requirements for admission to college in America were limited to the classical languages and literatures. During the eighteenth century in some cases the elements of arithmetic were added to the requirements, at Yale as early as 1745. Up to the close of the eighteenth century Latin, Greek, and arithmetic were the only subjects required for admission to the existing American colleges. As long as the dominant function of the secondary school was conceived to be preparation for college and as long as the college itself aimed toward a single uniform course of study with special reference to training for the higher professions, little change was to be expected in the admission requirements. However, when the character and scope of secondary education was changed, as in the case of the academy and high-school movements, the enriched curriculum of the secondary school made it possible for the colleges to enlarge the scope of their admission requirements, and some of the newer subjects were added to those requirements, e.g., geography, algebra, geometry, and history. It is to be noted that the first change was one of increase in the amount and number of requirements rather than one of differentiation. In general, throughout the nineteenth century, there was a tendency to increase constantly the number of subjects and the amount of preparation required for entrance to college.

While changes in the scope of the secondary school were occurring somewhat analogous changes were taking place in the colleges and universities. The nineteenth century brought with it new demands on the colleges as well as on the secondary school — demands for changes in the aims and functions of college education which finally resulted in differentiated courses of study and differentiated institutions. Throughout the seventeenth century the main purpose of the college was the training of ministers, more than two thirds of college graduates entering that profession. During the eighteenth century the proportion of graduates entering the ministry decreased while the proportions of those entering the professions of law and medicine increased, the three professions together attracting more than three-fifths of all college graduates during the eighteenth century and the first half of the nineteenth century. The period from about 1850 to the present has been one of constantly increasing differentiation of the college student body. These changes are clearly indicated in the following table.

TABLE CVIII. THE DISTRIBUTION OF COLLEGE AND UNIVERSITY GRADUATES: PERCENTS ENTERING VARIOUS PROFESSIONS *

Periods	*Ministry*	*Law*	*Medicine*	*Education*	*Commerce*	*Public service*	*Engineering*	*Agriculture*	*Literature and journalism*	*Unclassified*
1642–1645	70.0	...	5.0	5.0	...	...	...	5.0	...	15.0
1696–1700	65.6	1.6	3.1	4.7	1.6	9.4	...	...	...	14.7
1746–1750	37.9	7.5	15.8	4.2	9.2	6.2	...	2.5	...	16.7
1796–1800	21.4	30.5	8.4	5.7	5.6	1.1	.1	2.4	.1	24.7
1846–1850	23.1	25.8	10.8	10.1	10.0	1.8	1.5	2.9	1.9	13.1
1871–1875	16.7	28.1	8.5	13.2	16.4	1.2	2.4	2.4	2.5	8.4
1896–1900	5.9	15.6	6.6	26.7	18.8	1.0	3.5	.7	1.1	18.9

* Burritt, B. B., *Professional Distribution of College and University Graduates*, Bureau of Education Bulletin (1912), no. 19, p. 144. The effect of the development of higher education for women may be observed in the proportion of college graduates becoming educators.

With the introduction of differentiated courses in the college and with the development of special colleges, such as those for engineering and agriculture, there grew up different sets of admission requirements and a lack of uniformity therein. Eventually the variation in admission requirements resulted in an intolerable burden on the secondary schools.

130. The amount of preparation required. Recent attempts to secure a certain amount of uniformity and standardization in college admission requirements have led to substantial agreement in defining those requirements in terms of "units." "A unit represents a year's study in any subject in a secondary school, constituting approximately a quarter of a full year's work."[1] This assumes that the length of the school year is from thirty-six to forty weeks, that a period is from forty to sixty minutes in length, and that the study is pursued for four or five periods a week; but under ordinary circumstances, a satisfactory year's work in any subject cannot be accomplished in less than one hundred and twenty sixty-minute hours, or their equivalent.[1] A large proportion of colleges and universities now state their requirements in terms of units as thus defined. Current practice regarding the amount of preparation required by standard colleges for admission may be seen from the following table.

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[1] Bureau of Education Bulletin (1916), no. 20, p. 8.

TABLE CIX *

Institutions	*Number*	*Number of units required*								
		14	14.5	15	15.5	16	16.5	17	17.5	*Average*
Colleges of liberal arts....	204	39	31	116	5	12	0	0	1	14.8
Colleges of engineering ...	85	27	5	50	0	3	0	0	0	14.7
Colleges of agriculture....	31	9	1	21	0	0	0	0	0	14.7
Total..........	320	75	37	187	5	15	0	0	1	14.7

* Kingsley, C. D., *College Entrance Requirements*, Bureau of Education Bulletin (1913), no. 7, p. 7.

It will be noted that one college only (Bryn Mawr) requires more work than can readily be accomplished by the high-school pupil in his four-year course. Hence, with respect to admission requirements, such difficulties as may be found in articulating the secondary school with the college are to be found in the character and distribution of the units required rather than in the amount of preparation demanded.

131. "Prescribed," "Accepted," and "Elective" subjects. Much more important than the question of the amount of preparation for admission to college (where the amount is reasonable) is the question of the amount of rigidity or flexibility found in those requirements. When all subjects required for admission to college were prescribed and the amounts of material to be mastered in those subjects were fixed, the secondary school which desired to fit any of its pupils for admission to college was under the necessity of determining its curriculum on the basis of the college admission requirements, to the detriment of those pupils not destined for a college education. Such rigidity, once the rule, no longer obtains. The oldest method was to prescribe definite subjects for admission to college and to demand specific amounts of those subjects of all candidates for admission. This was modified during the last half of the nineteenth century in such a way as to prescribe definite amounts of work in certain subject groups, — English, mathematics, foreign languages, science, and history, — but to permit the election of the particular language, science, and history. Later still this method was further modified so that certain amounts of prescribed subjects were specified and other subjects allowed to be chosen from lists of "accepted subjects." Finally the method of admission has in some cases been so modified as to allow a "free margin" of "elective" subjects which may be chosen from any of the subjects accepted by an approved high school toward graduation. In a few cases the extreme form of this method has been adopted, allowing a free election of the entire fifteen units required. The practice of allowing a "free margin" is not, however, the rule in most colleges, and in general uniformity is lacking, in some cases subjects required by certain colleges not even being accepted in others of equal rank.[1]

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[1] Bureau of Eucation Bulletin (1916), no. 20, p. 8.

132. **The distribution of prescribed units.** While there is wide variation in the manner in which prescribed units are distributed, there is also at present considerable uniformity in the more essential elements involved and in

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[1] Kingsley, C. D., *op. cit.*, pp. 17–18.

theory agreement is general that the high-school course, where preparation for admission to college is considered legitimate, should include at least three units of English, one of natural science, and one of social science.

> These five units, together with two or two and one half units of mathematics almost uniformly included constitute one half of the total number of units required for admission, and the prescription of these units has comparatively little effect in reducing flexibility except when the college specifies some particular science or epoch of history.[1]

In 1899 the Committee of Ten on College Entrance Requirements recommended that the following ten units should be included in the high-school course and in college entrance requirements:

> Four units in foreign language (no language accepted in less than two units), two units in mathematics, two in English, one in history, and one in science.[2]

The recommendations of that committee did much to reduce the variability which had previously existed, but it failed to produce satisfactory conditions, largely because of the requirements in mathematics and the fact that many colleges required a greater amount of foreign language than that recommended by the committee.

Certain features found in present conditions are worthy of note. In a study of 204 colleges of liberal arts Kingsley found that 10 colleges (in 1912) did not *prescribe* any particular subject for graduates of fully approved high schools. All colleges that prescribed any subject prescribed English and in some cases English was the only subject prescribed. Every college that prescribed any subject other than English prescribed mathematics. In the case of foreign languages was found the greatest variation in prescribed units. The present tendency is to reduce the amount of foreign language, both in high-school courses and in college admission requirements and to permit a choice between ancient and modern languages. A student who can offer no Latin and only three units of German can meet the foreign-language requirements of 110 colleges of liberal arts and become a candidate for the Bachelor of Arts degree in 73 of those colleges. Out of 204 colleges of liberal arts 22 admit students without any language other than English. Only 94 out of 204 colleges of liberal arts prescribe any natural science for admission. History is prescribed by 163 of those colleges.

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[1] Kingsley, C. D., *op. cit.*, p. 11.

[2] National Education Association. *Report of Committee on College Entrance Requirements*, p. 32.

Flexibility in the curriculum of the high school which must provide secondary education for those going to college and those not is greatly affected by the extent to which the colleges recognize as counting toward admission the various subjects commonly found in the high-school course. For 1912 Kingsley gives the following table of subjects accepted by colleges of liberal arts as counting toward admission to the bachelor of arts course.

TABLE CX. NUMBER OF SUCH COLLEGES ACCEPTING VARIOUS SUBJECTS FOR ADMISSION *

Subjects	*No.*	*Subjects*	*No.*	*Subjects*	*No.*
Latin	203	Zoölogy	175	Business	88
Greek	202	Physiography	174	Household economics	79
German	197	Physiology	151	Geology	64
Physics	196	Drawing	124	Music	62
Chemistry	194	Spanish	118	Astronomy	54
French	192	Shopwork	97	Agriculture	80
Botany	181	Economics	92	General science	43

(Others will consider subjects not commonly accepted.)

* Kingsley, *op. cit.*, p. 27.

Current practice (1912) in the distribution of prescribed and elective units may be seen from the following table.

TABLE CXI *

	Colleges of liberal arts	*Colleges of engineering*	*Colleges of agriculture*	*Total*
Number of colleges considered	203	85	31	319
Prescribed units, average number	10.7	10.1	8.1	10.2
English	2.9	3.0	2.9	2.9
Mathematics	2.3	3.1	2.2	2.5
Foreign language	4.0	2.0	1.2	3.1
Natural Science	0.5	1.0	1.0	0.7
Social Science	1.0	0.9	0.8	0.9
Drawing	0.0	0.1	0.0	0.0
Elective units, average number	4.1	4.6	6.6	4.5
Required units, average number	14.8	14.7	14.7	14.7

* Compiled from data given by Kingsley, C. D., *op. cit.*, pp. 28, 73, 89.

It is to be noted from this table that the only requirements likely to cramp the work of the high school in any important way are the requirements in English, mathematics, and foreign language, and of these the most noticeable is the requirement in foreign languages for admission to the colleges of liberal arts or the "general" college. In all three of these subject groups the problem centers largely around the necessity of so distributing the pupil's work in the secondary school that in some fields his education shall proceed beyond the elementary phases and at the same time that the pupil shall receive some insight into a variety of fields of knowledge and training. With unlimited election of subject for admission to college it is possible (where the secondary school permits) for the student entering college to have studied the elementary phases of a number of subjects and never have carried his acquaintance with any one subject or group of subjects beyond the elementary or introductory stage. With recognition of the desirability of a certain amount of concentration in one or more fields, together with a certain amount of distribution in other fields, there is a growing tendency for colleges to adapt admission requirements and for secondary schools to adapt courses of study so as to provide for such concentration and distribution. This is obvious in the admission requirements of such colleges as the University of Chicago, Harvard University, etc., and in the recommendations of the Committee of the National Education Association on the Articulation of High School and College (1911).

133. Recommendations of the Committee on Articulation. In 1910 a committee was appointed by the Secondary Department of the National Education Association to consider the problem of the articulation of the high school and college. The committee's report was accepted in 1911. The substance of that report is indicated by the recommendations made regarding a well-planned high-school course.[1]

1. The quantitative requirement should be 15 units. The definition of the unit there adopted is that given in Section 132 above.
2. Every high-school course should include at least three units of English, one unit of social science (including history), and one unit of natural science.
3. Every high-school course should include the completion of two majors of 3 units each and one minor of 2 units, and one of the majors should be English. The following subject groups are recommended as majors: three units of English; three units of mathematics; three units of one foreign language; three units of social science; three units of natural science.
4. The requirement in mathematics and in foreign languages should not exceed 2 units in mathematics, and 2 units of one language other than English.

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[1] *Proceedings of the National Education Association* (1911), pp. 559–67. Cf. Kingsley, *op. cit.*, pp. 97–105.

5. Of the total 15 units, not less than 11 units should consist of English, foreign language, mathematics, social science (including history), natural science, or other work conducted by recitations and home study. The other 4 units should be left as a margin to be used for additional academic work or for mechanic arts, household science, commercial work, and any other kind of work that the best interests of the student appear to require.

4 (a). In place of either two units of mathematics or two units of foreign language, the substitution, under proper supervision, should be allowed of two units, consisting of a second unit of social science (including history) and a second unit of natural science.

According to these recommendations three general groupings would then be possible for the ten or eleven units in prescribed groups:

TABLE CXII *

	A	*or*	*B*	*or*	*C*
English	3		3		3
Foreign language	2		2		0
Mathematics	2		0		2
Social science	1		2		2
Natural science	1		2		2
Total specified	9		9		9
To be added to complete second major	1 or 2		1		1
Total	10 or 11		10		10

* From the *Supplementary Report of the Committee on Articulation*, p. 566. Cf. Kingsley, *op. cit.*, p. 104.

It will be noted that the essential principle of this plan is the grouping of parts of subjects or of allied subjects with more or less freedom of choice within groups, thus providing for consecutive and fairly advanced work in at least two or three fields, and still leaving sufficient freedom to allow flexibility in the work of the secondary school.

III. METHODS OF SELECTING STUDENTS FOR ADMISSION TO COLLEGE

134. **Examination and certificating systems.** Closely related to the problems of subject requirements for admission to college are problems involved in the methods by which the selection is made of those who are fitted to take up the work of the college. The interest here enters on those problems as affecting the work of the secondary school rather than as affecting the college. Historically the fitness of high-school graduates for admission to college, until within the past few decades, has always been tested by examinations. Around the system of examinations for admission to college there grew up a body of formality and machinery which seriously interfered with the transition of the student from one institution to the other, thus creating an important "break" in the system of education. Recognition of this "break" in our system of education and the rise of public State colleges and universities have led within the past few decades to the introduction and rapid development of "certificating" or "accrediting" systems, whereby successful work accomplished in the high school is assumed to be an adequate indication of fitness for admission to college. The operation of the two different systems and its effect on the work of the secondary school are deserving of consideration.

135. **Examination methods in practice.** As long as the early colleges in this country drew their students from secondary schools where there was little opportunity for close observation of the work done, and as long as there existed little uniformity in the character of the work done in those schools, the examination system was the only method possible for selecting candidates who were fit for college work. With the increase in the number of colleges with varying requirements and with varying forms of examination

considerable confusion arose, and the difficulties of preparation and of selection became great. To meet those difficulties a number of methods were adopted looking toward uniformity and the simplification of the system of examinations. Among these the most important from the view of examinations was the establishment of the College Entrance Examination Board in 1900. Originally the aim of this board was to provide uniform examinations for all candidates for admission to the colleges which formed the association. It has resulted in the establishment of an examination system the results of which are accepted for admission to practically every college in the country although in practice the majority of those who take the examinations enter colleges in the North Atlantic States and come from those States. In the first examinations conducted by the board less than one thousand candidates were examined. In 1915 nearly five thousand candidates were examined. Further examples of centralized examination systems, though differing widely from that mentioned above, are found in the Examinations conducted by the Board of Regents in New York State, and to some extent in the systems of Minnesota and Florida.

An important modification of the examination system was made when several colleges adopted the plan in whole or in part of testing candidates by means of "comprehensive" examinations designed to test the power of the candidate rather than specific and detailed accomplishment in certain subjects. The character of such examinations and their bearing on the work of the secondary school may be seen from the substance of a memorandum presented to the College Entrance Examination Board:

> To be most useful the new comprehensive papers must be adapted: (1) to such variety of school instruction as exists in the several subjects — that is, they must not prescribe methods, but must recognize the general principle that the schools determine

how they shall teach a subject and that the College tests results or power; (2) to different stages of training in the subjects in which they are set — that is, they must give boys opportunity to show their power whether they have had the minimum or the maximum amount of training given in school.[1]

The adoption of such a plan for comprehensive examinations (in addition to the ordinary examination) by the College Entrance Examination Board in 1916 permits greater flexibility in the work of the secondary school wherever advantage is taken of the opportunity.

136. Advantages and disadvantages of examinations. Examinations must always be necessary when no other adequate means exist whereby the fitness of candidates can be determined. In the majority of cases, however, examinations cannot be justified on the ground of necessity only. Among the claims that are made of the advantages of the examination system are the following: (1) that the examination is the best test of the candidate's fitness; (2) that examinations afford an opportunity and impelling stimulus to reorganize as a whole material previously studied; (3) that examinations stimulate the endeavor of the boy or girl in high-school work by offering a definite objective point; (4) that examinations afford training in meeting crises. In the case of college entrance examinations the last claimed advantage may be ignored on the ground that any one of two sets of examination are inadequate to produce the training claimed. The second and third advantages claimed undoubtedly possess some validity, though it may be noted in connection with the second that the organization of material in review is a matter of method not necessarily involving examinations. In connection with the third claim it may be noted that certain evils are also involved.

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[1] College Entrance Examination Board, *Fifteenth Annual Report of the Secretary* (1915), pp. 4–5.

To all these possible advantages claimed for the examination method must be opposed many disadvantages. It may be noted first that single tests commonly do not indicate the true status of an individual with regard to any single mental trait, much less with regard to the complex mental traits involved in any subject such as forms the basis of the college-entrance examinations. The true status of an individual in any mental trait is to be determined by a number of separate measurements. In the second place the variability of judgments and the personal equation of the markers enter largely into the interpretation of the ability manifested by the examinee, as has been shown clearly by the investigations of Starch and Elliott and others.[1] Thus in marking the same examination paper the grading of one marker may differ from that of another to such an extent as to invalidate completely the gradings of a large number of candidates. The present writer found in the case of thirteen geometry papers marked by thirteen readers of the College Entrance Examination Board ranges as large as twenty-seven and thirty-three points on a percentile scale between the highest and the lowest markers of the same paper, and an average deviation as high as 5.57 per cent from the central tendency of the marks assigned. The average deviation for the thirteen markers grading thirteen papers for the Board was 3.69 points on a percentile scale.[2]

In the third place, it may be noted that the examinations as usually conducted fail to determine with even a fair degree of accuracy the fitness of candidates to do college work. Here the results of Thorndike's investigation are in point.[1] Thorndike compared the standings of students on examination for entrance to Columbia University with their standings while in college. The results of his investigation showed that success in college work cannot be estimated from success in the entrance examinations

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[1] Starch, D., and Elliott, E. C., "The Reliability of Grading Work in English," *School Review*, vol. XX, pp. 442–57; same, "History," *ibid.*, vol. XXI, pp. 676–81; same, "Mathematics," *ibid.*, vol. XXI, pp. 254–59. Cf. Starch, D., "Reliability and Distribution of Grades," *Science*, vol. XXXVIII, pp. 630–36; same, *Educational Measurements*, pp. 3–15. Cf. Kelly, F. J., *Teachers' Marks*, pp. 51–84.

[2] It should be stated that the figures were secured before the markers had "standardized" their marking system and hence are higher than the final variability.

> with enough accuracy to make the entrance examinations worth taking or to prevent gross and intolerable injustice from being done to many individuals. For instance, 6 out of the 130 received the same average entrance mark — 61. In their college work of junior year, 1 averaged a trifle above D; 1 half-way from D to C; one a little above C; and 2 received A in four subjects out of five, and B in the other. In freshman and sophomore year, the range was nearly as great. . . .
>
> It is certain that the traditional entrance examinations, even when as fully safeguarded as in the case of those given by the College Entrance Examination Board, do not prevent incompetents from getting into college; do not prevent students of excellent promise from being discouraged, improperly conditioned or barred out altogether; do not measure fitness for college well enough to earn the respect of students or teachers; and do intolerable injustice to individuals.

On the other hand, Jones maintains relatively high correlations between the standing of students on entrance examinations and in the freshman year of college, basing his conclusions on such figures as are shown in Table CXIII.

The defects of the examination system considered above have to do largely with the question from the standpoint of the college or the entire system of education. Further defects are claimed to be involved from the standpoint of the secondary school. Most important among these is the fact that examinations tend to set up a formal and artificial goal

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[1] Thorndike, E. L., "The Future of the College Entrance Examination Board," *Educational Review*, vol. XXXI, pp. 470–83; Strayer, G. D., and Thorndike, E. L., *Educational Administration*, pp. 176–87.

TABLE CXIII. THE RELATION OF STUDENTS' STANDING ON ENTRANCE EXAMINATION AND IN THE FRESHMAN YEAR OF COLLEGE *

On entrance examinations in	*Freshman year in college in*			
	Highest quarter	*Next to highest quarter*	*Next to lowest quarter*	*Lowest quarter*
Highest quarter (50 men)	30	13	5	2
Next to highest quarter (50 men)	16	17	12	5
Next to lowest quarter (50 men)	3	13	16	18
Lowest quarter (50 men)	1	7	17	25

* Cf. Jones, A. L., "Entrance Examinations and College Records," *Educational Review*, vol. XLVIII, pp. 109–22.

for secondary-school pupils, who look forward to entering college. The narrow minimum demands for college entrance tend to become the principal aim of the college-preparatory work of the secondary school and to influence the other work of the school in a way unfavorable to high standards of real attainment. The securing of "points" or "credits" becomes the aim rather than the attainment of knowledge or training; the methods of study and teaching are extensively affected by the possibility of "cramming," and consistent, steady work day by day receives little encouragement when the pupil feels that all will depend on examinations. The introduction of "comprehensive" examinations will doubtless tend to reduce these evils.

137. **The certificating or accrediting system.** The period following the Civil War was noticeably a period of rapid development in public systems of education and in State colleges and universities. Where such State systems included public colleges and universities there existed a situation favorable to the development of closer articulation between

the secondary schools and the colleges, and out of such situations developed the system of admitting students to college through a certificating or accrediting system on the basis of satisfactory completion of the high-school course. One of the first institutions to adopt the certificating system was the University of Michigan in 1871. In 1873 the State Board of Education of Indiana and Indiana University adopted regulations which practically initiated a State-wide system of accrediting high schools, the administration of that system being in the hands of the Board of Education. The movement commended itself to school and college authorities throughout the country, though most extensively in the West and Middle West, and by 1895 forty-two State universities and one hundred and fifty other institutions had adopted the accrediting system in some form.[1] At the present time the accrediting system is recognized by nearly all colleges and universities in the country, the only important exceptions being a few prominent universities (e.g., Harvard, Yale, Princeton, Columbia, Bryn Mawr) in the East.[2] These have adopted certain elements of the certificating system in combination with the admission examinations.

138. **The advantages and disadvantages of the accrediting system.** The prime question regarding the accrediting system as a means whereby candidates may be admitted to college is: Does it admit the fit and exclude the unfit? The answer to this question in theory is that a judgment based on all the work done by a boy or girl for four years in the secondary school would appear to be the most reliable. Do results in practice accord with this theory? It would appear that they do. Dearborn compared the school and college standing of 472 students who entered the Univer-

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[1] *Report of the United States Commissioner of Education* (1894–95), vol. II, pp. 1171–88.

[2] Since this was written the majority of women's colleges of New England have reverted to the examination system.

sity of Wisconsin on certificate in 1900 to 1905. He found that

> pupils tend to maintain in the university the same relative rank which they held in the high school. . . . Of the 472 pupils, only five who stood in the lowest quarter of the group on entrance, succeeded in reaching the rank of the first quarter (during the freshman year), and they secured only the lowest grade in that quarter; similarly, but five of those who entered in the first quarter of this large group, dropped to the lowest quarter during the freshman year; and they stood in the highest grade of this quarter. These results seem remarkable when we contrast them with the notions, often current, of the extent of reversal which the freshman year of the university makes in the careers of high school students.[1]

Dearborn further found a correlation of more than eighty per cent for the standing of students in the high school and in the freshman year of the college.[2] Numerous other studies have indicated much the same facts as those suggested by Dearborn's study. Thus Smith secured the data presented in the Table CXIV, showing the retention in the college of students belonging to different scholarship groups in the high school.

Essentially the same results were found by Pettit.[3] Clement's investigation discloses the fact that from 75 to 80 per cent of pupils were found in the same tertile of the total groups in high school and college.[4]

Even more conclusive were the results of Lincoln's study of the relative standing of students in the freshman and sophomore years at Harvard College, in the high school, and on entrance examinations. His findings indicate that where the same individuals are concerned the standing of those

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[1] Dearborn, W. F., *The Relative Standing of Pupils in the High School and in the University*, pp. 17, 19.

[2] *Ibid.*, p. 21.

[3] Pettit, W. W., *A Comparative Study of New York High School and Columbia College Grades.*

[4] Clement, J. A., *Standardization of the Schools of Kansas*, p. 129.

TABLE CXIV. RETENTION IN SCHOLARSHIP GROUPS IN THE COLLEGE OF PUPILS WHO WERE IN DIFFERENT SCHOLARSHIP GROUPS IN HIGH SCHOOL *

In high-school work	*In the college work*				
	Highest quintile (per cent)	*Second quintile (per cent)*	*Third quintile (per cent)*	*Fourth quintile (per cent)*	*Lowest quintile (per cent)*
Highest quintile	54	17	17	4	8
Second quintile	25	29	17	13	16
Third quintile	17	25	20	21	17
Fourth quintile	0	25	25	33	17
Lowest quintile	4	4	21	29	42

Table should be read thus: of pupils who were in the highest quintile in the high school fifty-four per cent were in the highest quintile in college. Seventeen per cent dropped to the second quintile, etc.

* Smith, F. O., *A Rational Basis for Determining Fitness for College Entrance.*

TABLE CXV. CORRELATIONS OF STANDINGS OF STUDENTS IN COLLEGE, IN THE HIGH SCHOOL, AND ON ENTRANCE EXAMINATIONS *

	Coefficient of correlation	*Probable error*
Freshman-year college work and high-school work	.69	.02
Freshman-year college work and examinations	.47	.03
Sophomore-year college work and high-school work	.58	.02
Sophomore-year college work and examinations	.41	.04
Examinations and high-school work	.46	.03

* Lincoln, E. A., "The Relative Standing of Pupils in High School, in Early College, and on College Entrance Examinations," *School and Society*, vol. v, pp. 417–20. (Pearson coefficient employed.)

students in their high-school work as measured by the average grades received therein would have been one and a half times as reliable an index of their ability to do the work of the freshman year in college as were their standings on the entrance examinations. His figures are given in Table CXV.

The special value of these figures is found in the fact that they permit a direct comparison between the reliability of high-school grades and entrance-examination grades as measures of the ability of the same students to do college work of the freshman and sophomore years.

In the above discussion emphasis has been placed on the benefits which the college is claimed to derive from the adoption of a certificating system. No less benefits are claimed for the secondary school. These have been emphasized by Brown as follows:

> It would be hard to overestimate the good already accomplished by the accrediting system, in spite of all defects. It has given to communities a means, which had been lacking, of discovering the deficiencies, and likewise, the excellences of their schools. It has greatly aided the better principals and teachers in their efforts to maintain high standards of scholarship. It has quickened the intellectual life of schools and of whole communities, by the immediate touch of university ideals. In some States, as in Missouri, it has virtually called into being a new and better and more general provision for secondary education, within a very few years. In some States, under its influence, the improvement of the teaching in such schools has gone forward at an unprecedented rate.[1]

By no means the least advantage resulting from the adoption of the accrediting system is to be found in the fact that it has brought into closer and better coördination the secondary school and the college by removing one of the greatest barriers between the two institutions.

The accrediting system has its merits. It also has its serious disadvantages. The first of these is found in the fact that it can never completely meet the needs of the situation. The very character of the system and the necessity of maintaining standards make it necessary that some schools must be denied the certificating privilege. Yet some pupils who are worthy of admission to college will always be found in such schools. The accrediting system must always select pupils according to schools: the examination emphasizes selection by individuals. Hence some form of examination for some students must always supplement the accrediting system. The second defect in the accrediting system is found in the difficulty of its administration, especially with reference to the supervision or inspection of the work of the secondary schools — a provision which is necessary if standards are to be maintained. In such supervision or inspection of the secondary schools by the colleges it is to be noted that there is always danger that undue control over the work of the high schools may be exercised and that many evils now perpetuated by the dominance of the college over the secondary school may be continued.

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[1] Brown, E. E., *The Making of Our Middle Schools*, pp. 376–77. Quoted with the permission of the publishers, Longmans, Green & Co.

139. Methods of administering the accrediting system. In general two different methods of administering the certificating or accrediting system are found, the essential difference between the two being found in the methods employed for determining the selection of secondary schools to which the accrediting privilege should be granted.

(1) *The New England College Entrance Certificate Board:* This board was established in 1902 for the purpose of creating a certificate "clearing house" for the colleges of New England. In general the standing of the secondary school and the character of the work done in any given school is determined by that board on the basis of the accomplishment in college of graduates who are certificated from that school. According to the success or failure of such certifi-

cated graduates the certificating privilege is granted or withdrawn from any given school. The advantage of the method is found in the simplicity with which it can be administered. The defects are found in the possible unfairness in determining the character of any school on the basis of a few scattered representatives of the school and in the fact that it encourages weak schools to retain their standing with the certificating board by refusing certificates to any but the best pupils. Dissatisfaction with the method is not unknown among the secondary schools of New England and at least one New England College. It is to be noted also that the method provides for little coöperation between the college and the secondary school which may improve the work of the latter.

(2) *The inspection method.* In the majority of States in the country the standing of the secondary school with reference to the granting or the withholding of the accrediting privilege is determined on the basis of the character of the work done in such schools as ascertained from the inspection and supervision of them by college officers, State officials, or commission representatives. Such is the method adopted by numerous State colleges and universities, by State boards of education, and such general commissions as the Commission on Accredited Schools of the North Central States (established in 1901 by the North Central Association of Colleges and Secondary Schools), etc. The merits of the inspection system are found in the close relations which they have developed in such States between colleges and secondary schools, the intimate acquaintance with problems of public secondary education gained by college representatives, the upbuilding influence of the college on the school, and the success of the method in determining the fitness of graduates for college work. The defects of the method are those involved in the difficulties of providing effective

inspection and supervision in some territories and the amount of administrative machinery required effectively to carry out the plan. These difficulties are great. Nevertheless, they have been met with satisfactory results in general, particularly in the Middle West, and with improved organization and administration the difficulties inherent in the plan should not prove unsurmountable.

In this connection two suggested schemes are worthy of mention. Both arise out of the operation of existing systems in cases where the college and the secondary school are geographically distant. The first is that suggested by Thorndike, who recommended in 1906 that the College Entrance Examination Board assume the added function of a clearing-house for certificates, the accrediting being based on the actual success in college of the students endorsed by each secondary school.[1] The advantages of such a plan are obvious, but no action has ever been taken. The second suggestion is that of Henderson, who recommended that the National Association of State Universities appoint a Commission to control the matter of accrediting.[2] Previously, Broome had suggested that desirable conditions for the wide use of the accrediting system could come only with the existence of a national board of inspectors for secondary schools.[3] Meanwhile, the difficulty of a college determining the status of any secondary school situated at a distance has been somewhat relieved by the publication of lists of accredited schools prepared from lists of various independent accrediting bodies.[4]

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[1] Strayer, G. D., and Thorndike, E. L., *Educational Administration*, pp. 176–87.

[2] Henderson, J. L., *Admission to College by Certificate*, pp. 165–66.

[3] Broome, E. C., *op. cit.*, p. 125.

[4] Published at intervals by the Bureau of Education.

PROBLEMS FOR FURTHER CONSIDERATION

1. To what extend have the functions of the college and university changed within the past half-century or so? How have those changes affected the work of the secondary school and its relation to higher institutions?
2. Compare the articulation of the secondary school and college or university in Germany, France, England, and America.
3. To what extent do the curricula of the public secondary school and the college overlap?
4. Compare the articulation of the public secondary school and the State college or university with the articulation of the public secondary school and the private college or university.
5. Compare the proportion of high school graduates going to college in States where the leading college is public and in States where the leading college or colleges are private. Compare also the high school populations in those States. (Cf. *Report of the United States Commissioner of Education* (1914), vol. II, pp. 416, 415, 411.)
6. Study the historical development of college admission requirements in English, mathematics, or foreign languages.
7. Compare the college entrance requirements of: (*a*) Harvard, Princeton, Yale, Columbia; (*b*) the University of Chicago, the University of Michigan, the University of California, Amherst College. (Cf. Kingsley, C. D., reference in following bibliography.)
8. Study the requirements for entrance to public normal schools. What relation do they have to the public secondary school?
9. Compare more in detail the advantages and defects of the examination system and the accrediting system of admission to college, with special reference to their effect on the public secondary school.
10. Compare the certificating systems of the Commission on Accredited Schools of the North Central States and of the New England College Entrance Certificating Board, with special reference to their effect on the public secondary school.
11. What are the merits and demerits of the junior college?
12. For any given secondary school or group of secondary schools compare the relative standing in school and college of its graduates.

SELECTED REFERENCES

NOTE: The literature dealing with the relation between secondary education and higher education is so voluminous that any extended bibliography is here impossible. Hence there are included below such references only as (*a*) represent somewhat comprehensive treatments of the field; (*b*) the carefully considered reports of various organizations, committees, departments of education, etc.; (*c*) special articles dealing with most recent phases of the topic; (*d*) articles and reports dealing with actual experiments and investigations.

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Hollister, H. A., *High School Administration*, chap. XIII.

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II. Reports of committees, organizations, etc.:

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CHAPTER IX

SOCIAL PRINCIPLES DETERMINING SECONDARY EDUCATION

140. Some underlying assumptions. Social theory must always furnish the basis whereon are established conceptions of the functions which education should perform. The social theory underlying the considerations adduced in this chapter involves certain assumptions the substantiation of which cannot be attempted here. Among those assumptions the more fundamental are the following.

(1) Society is to be conceived as in evolutionary process. In that process are involved the two factors of integration and differentiation, the former working toward social cohesion and solidarity, the latter working toward variation and modification.

(2) There is an essential congruity of interest between the individual and society. The possibility of the development of the individual is found in his participation in social activities and in the social consciousness. The possibility of the development of society is found in the development of social personalities in individuals.

(3) The school is to be considered as a social institution or agency maintained by society for the purpose of assisting in the maintenance of its own stability and in the direction of its own progress.

141. Secondary education as a social institution. If the school is to be looked on as an institution established, maintained, and controlled by society for the purpose of maintaining its own stability and determining the direction of its own progress, secondary education, as a part (and as a part only) of a general system of education, must be conceived as determined fundamentally by its functions as a social agency. Looked at from this point of view secondary education involves a number of important social principles some of which may be formulated here and considered further in following sections.

(1) The character and purposes of secondary education at any time and in any society must conform to the dominant ideals and to the form of social organization of that society.

(2) The dynamic character of the social process requires the constant readjustment of secondary education to the changing demands of society.

(3) The nature of social evolution involves the two supplementary factors of integration and differentiation, both of which must be recognized properly in secondary education.

(4) Whenever any other social institution fails to provide forms of education socially desirable the school should assume responsibility for those forms of education as far as may be possible. Whenever such forms of education are appropriate to the age and grade of secondary education, the secondary school should assume responsibility for them. Conversely, whenever other social agencies provide adequately for forms of education socially desirable the school should not attempt to assume responsibility for them.

142. **Social ideals and social organization.** In discussing the historical development of secondary education the point was emphasized that the efficiency of the secondary school is to be measured in terms of the degree in which it conforms and contributes to the dominant social ideals and form of social organization at any particular time. In discussing systems of secondary education in different countries the point was emphasized that the efficiency of the secondary

school is to be measured according to the dominant social ideals and the form of social organization peculiar to each country. In the present section the principles of education involved may be considered with special reference to the social ideals and social organization of the American Democracy.

To state that the American secondary school should conform to the democratic ideals and the democratic organization of Amercan society is to state a platitude. The implications of such a statement, however, are not always clearly perceived and may bear further consideration. Three important implications invite attention.

(1) Efficient membership in American society demands at least three qualifications: (*a*) an ability effectively to execute the formal and informal duties of citizenship and carry the burden of political responsibility; (*b*) an ability to produce and labor sufficiently to carry one's own economic load; (*c*) an ability to utilize one's leisure time and act in an individual capacity without interfering with the interests of others or of society at large. In certain societies where other social ideals are dominant it is possible for many of the privileges and responsibilities of citizenship to be prerogatives of special groups. In some forms of society it is possible for economic production to rest principally on certain groups. In certain forms of society opportunities for the enjoyment of leisure are open to different groups in degrees determined by social ideals which greatly limit certain individuals or groups. In the American democracy the three forms of activity must be considered as important for every citizen in so far as his individual capacity and circumstances permit. It follows, therefore, not only that educational opportunity, including secondary education, should be universal in America, but also that these three phases of activity must be conceived as necessary parts of the education due

every individual and that in the secondary school each of the three phases should receive attention in due proportion. Failure to recognize this principle in the past has led to over-emphasis on certain phases of secondary education and the comparative neglect of others. This is particularly noticeable in the comparative neglect until recently of the preparation of the worker in the American secondary school. Over-emphasis in the other direction for some pupils is a not impossible tendency in some quarters at the present time.

(2) It must be recognized that in American society each individual must be not merely a law-abiding citizen but also to some extent a law-making citizen. It must further be recognized that the minimum level of general intelligence necessary in any society must depend on the amount of privilege conferred on the individual and the amount of responsibility placed on him. In a society where for the majority of individuals the great necessity is conformance to imposed demands, a much lower level of general intelligence is required than in a society where the individual must not only conform to social demands but also determine in part what those demands shall be. Further it must be recognized that with the constantly growing complexity of modern social and economic life the amount of intelligence and training necessary to meet its privileges and responsibilities is much greater than at any former time. An education which was adequate for the needs of a simpler social organization cannot be adequate for the needs of a more complex society. Consequently it has become a serious problem in this country whether steps should not be taken to provide that a larger proportion of prospective members of American society should receive the benefits of education beyond the elementary school. The increased privileges and responsibilities granted to and demanded of the indi-

vidual in American society cannot be provided for by a system which gives two thirds of the citizens not more than an elementary education. The complicated social problems of modern civic and industrial life and of individual conduct cannot be understood and intelligently attacked by a people, two thirds of whom have received elementary instruction only and of which on the average individuals have received much less than one thousand days of schooling each. Unless the average amount of education received can be markedly increased the further development of American democracy must be seriously conditioned if not actually imperiled. The problem is one affecting most secondary education in the public schools.

(3) The participation of all citizens in the direction and control of all social institutions of a public nature includes a participation in the direction and control of the school as well as of other institutions. The agency on which democracy must most depend is one which democracy must itself determine and control. Even more than in most societies the American secondary school must conform to social ideals and the form of social organization.

143. **Social evolution and educational adjustment.** It is an obvious fact that as time passes society changes and the demands of the social organization are more or less modified. If it be recognized that the process of the development of social organization is evolutionary and that secondary education must conform to the dominant social ideals and form of social organization, we must conceive that secondary education must constantly be readapted to meet the changing needs of the society which it serves. Commonly such changes in social ideals and in the form of social organization as demand changes in secondary education develop gradually and consequently involve no great reorganization of secondary education at any one time if the latter is

gradually modified to meet the gradual changes in society. Institutions, however, and secondary education no less than any other institution, once firmly established, tend constantly to become more and more conservative and resistent of change — a characteristic which is a safeguard and at the same time a defect. Hence it is that important social changes, readily perceived and evaluated in historical retrospect, have seldom been clearly perceived by contemporary authorities and have seldom been met by appropriate changes in secondary education. As a result the cumulated effect of necessary changes in secondary education long deferred has commonly led to extensive reorganization at irregular intervals. This was the case in the development of the academy in America when the Latin grammar school was not adapted to meet contemporary demands of society, in the development of the public high school, and is to be observed in the present demand for the reorganization of secondary education calling for radical changes to meet the accumulated evils of existing schools.

No less important than the factor of absolute change in social ideals and social organization is the factor of the rate of change therein involved. The rate of development in most lines of social activity has been much more rapid within the past half-century or so than at any corresponding period of the past. Likewise development had been much more rapid in this country than in most others. At the present time in this country the rate of change in all phases of our social organization is rapid, and apparently the rate of change is likely to be rapid for some time to come. The recent tendencies in social development indicate clearly that present conditions will in all probability change in important ways within the life of the generation which is at present being prepared for membership in our society. There is a sense in which it is true that the educational process must be at least a generation behind the stage of society for which it is designed to prepare. To reduce that discrepancy as much as possible must be involved in any scheme for adapting secondary education to social needs. It requires but a slight examination to note that the activities of the present day call for some knowledges and skills that could not have been foreseen by those responsible for secondary education ten, fifteen, or twenty years ago. In the field of civic duties are such factors as the initiative and referendum, the recall of public officials, commission government, direct primaries, governmental-industrial relationships, female suffrage, and a multitude of other civic duties and civic problems specific preparation for which could not have been afforded in the secondary school for those who are now called upon to meet them. In the field of industry a multitude of new processes and new activities have developed within the past decade or so which the secondary school could not have provided for even if it had turned its attention to vocational education extensively. In the field of individual activity new opportunities for the individual's enjoyment have opened up within recent years for which the secondary education of fifteen years ago could not have established standards of conduct except in the most general way. We may be just as sure that equally important and extensive changes will face the pupils in our secondary schools at the present time which we cannot now foresee and for which, therefore, we can provide no specific preparation.

The obvious implication of this factor of the rapidity of change in certain phases of social activities is the recognition that mere adjustment to existing conditions in society of the pupils in the secondary school is inadequate — that to this there must be added the development of a capacity to readjust to the changed conditions which we may be sure will face the pupils after leaving the school, conditions which we cannot clearly foresee but which we know will in some respects differ from existing conditions. Of all elements in secondary education this is the one most likely to be neglected or minimized. The tendency in that direction is easy to explain. Mere adjustment to existing conditions is relatively easy, the path toward it is direct, and the returns immediate and readily perceived. The development of a capacity to readjust constantly to the changing conditions of life is relatively difficult, the path toward it is indirect, and the returns relatively remote and not readily observed. However, the difficulty of attaining and the difficulty of developing a capacity to readjust cannot justify the neglect of that phase of the social function of the secondary school.

144. **Social integration and differentiation.** In any society there are always two sets of forces at work which determine the form of social organization, one set of forces tending to bind together the various parts of society and to unify it, the other set tending to separate the various parts of society and to disrupt it. Without the first set of forces in operation there could be no real society: without the second set of forces in operation society would be static, non-progressive, and lacking the possibility of modification. Whatever be one's views of the form of social evolution the facts must be recognized that social forces are dynamic and that there are always two factors at work, one determining the essential unity and continuity of society, the other determining differentiation and change. The operation of the first factor may be termed "integration," that of the second factor "differentiation," terms borrowed from the field of biological evolution without necessarily implying any complete analogy between social and biological evolution.

In the units which go to make up society there are always elements of homogeneity and elements of heterogeneity.

On the maintenance of the proper equilibrium between those elements depend the existence, continuity, and progress of society and the problem in any society is twofold: (1) to develop out of the heterogeneous raw material that degree of homogeneity (like-mindedness) which is necessary for the permanence of the society; and (2) to provide that the maximum efficiency may result from individual differences in capacities, interests, and abilities, as well as from the adaptation of individuals to the widely differentiated needs of society. Between these two needs of society there must always be a certain amount of antagonism and conflict but it is an error to conceive that we must choose between them because of a certain opposition of function. Rather we must conceive that they are both necessary and that their relation is supplemental far more than antagonistic. In any society there is need of a certain amount of unity of thought, of feeling, of ideals, of standards, of conduct. Such unity is more necessary in a democracy such as ours than in any other society. But it is also true that individual differences and the differentiated needs of modern society demand recognition. Hence the factors of integration and of differentiation are both important and neither can be neglected without incurring the gravest social dangers. Failure to provide for the factor of differentiation has for centuries been noteworthy in the social organization and in education. Failure to provide properly for the factor of integration is a very real possibility in social, economic, and educational theory and practice at present.

The implication of this principle for education, and especially for secondary education, is clear. As an efficient social institution secondary education must recognize the necessity of provision for training which shall serve to make for integration, training which shall allow for the individual differences among the pupils and the differentiated needs of society, training in which the supplementary relation of the two factors is observed.

145. **Changes in other social institutions.** All the major activities of society and the greater part of the minor activities of society are organized into institutions which may be considered (*a*) as embodying the recognized purposes of society in the various fields of human activity, (*b*) as instruments of social control, and (*c*) as media for the communication and transmission of group experience. Among such institutions, of major importance are those centering around the home, the community life, the State, the Church, the vocation, and the school. Since they represent phases of the social purpose and of the social process, and since the social process is evolutionary, we must conceive of these institutions as susceptible of change with time and as themselves evolutionary. Hence we must expect to find institutions undergoing modification as time progresses, at times losing certain functions, at times adding new functions, at times changing the specific character and direction of their activities. Such changes are manifest in the history of every institution and the history of education indicates that the school as a formal agency of education originated and developed by assuming functions and activities which had previously belonged to other institutions.

Recognizing the fact that institutions change it is commonly held that when existing institutions afford socially adequate training in desirable social activities, the school as the formal agency of education should not assume the responsibility for such training, the reason for this being found in the fact that the direct education coming through actual participation in the activities of society is far more valuable than the indirect education provided by the school as a preparation rather than a form of actual participation. Conversely, it is commonly held that when any other social institution fails to provide or ceases to provide desirable forms of training adequately for the social demands, such training must be taken over by the institution specially designed for formal education — the school.

The implication of this principle for education is twofold — that the school must be expected to assume certain new functions as other institutions cease to meet them, and that, in some cases at least, the school must be brought into closer relation with other institutions for the proper coördination of functions of all educational institutions, formal and informal, and for the proper division of social responsibility. This must apply to secondary education as well as to other divisions of education, and it applies with special force at the present time. Within recent years important changes have taken place in the home, in the community life, in the State, in the Church, in the vocation, and in other social institutions, which have imposed on secondary education in the school many functions formerly exercised by one or more of those institutions. Those changes and their effects on secondary education are so important that they deserve more extended consideration in the following sections.

146. Changes in the home and family life. To some extent all other social institutions may be conceived as having developed out of the home and family as the fundamental social unit. Thus the State probably had its inception in the development of the family with its increasing number of members, through the clan and groups united by bonds of blood relationship and marriage. Thus religion and the church developed through the various forms of animistic, totemistic, and other forms of belief, in some cases primarily through the worship of common ancestors, the family or clan head being also the spiritual head of the social group. Thus the vocation was determined by the activities and needs of the family or clan. In general it is at least a tenable theory that the source of all institutional activities and functions is to be found in the activities and functions of the fundamental social group — the family.

The history of the school as a social institution shows clearly that its inception and its development can be traced to the assumption of activities and functions taken either from the home directly or from the home indirectly through other social institutions which have previously taken over activities and functions formerly belonging to the home. Inevitable changes occur from time to time in the home. In such cases three lines of change may be possible: compensating changes may be made in the home itself; the change in the home may be compensated by a change in some other institution; the change in the home may be compensated in the institution which society has created for that special purpose, i.e., in the school. Sooner or later the majority of such changes affect the school.

To trace even all the important changes in the school which were due to changes in the activities and functions of the home would be impossible here. Only some of the more important and somewhat recent of such changes can be here considered — such changes as apparently affect the present character of secondary education. These may be conveniently grouped under two heads: those affecting problems of moral-social education; and those affecting vocational education. In addition, however, we may consider certain changes in the relation between the home and the school.

(*1*) *Changes affecting moral-social education:* Within the past three or four generations the development of the home as an informal institution of education has been marked by important changes in the stimuli and opportunities for moral-social education, changes which have on the whole tended to lessen the influence of the home as an educational agency. The majority of those changes center around the lessening of the home or family solidarity. This is manifest in the lessening interdependence of members of the family; in the lessened amount of responsibility of the children of the family, accompanied in many cases by a greatly increased amount of privilege; in the withdrawal of the father, and sometimes the mother, from home occupations to occupations in the factory; in the effects of increased urbanization where the activities of the family are less unified; in the decreased religious atmosphere in the home; in the reconstruction of family relations in the case of foreign-born parents and native-born children; in the increase of divorce; and in a multitude of other ways. Scarcely two generations ago the social stimuli and the opportunities — nay, more, the necessities — of moral-social education in the home were far greater along important lines than is the case to-day, and the changes are due, not altogether to a decreased sense of responsibility on the part of parents, but to forces over which they have had little or no control. They have been necessary results of powerful social and economic forces at work throughout society. Thus less than half a century ago the "typical" family in America lived in a small town or on the farm, the occupations of the fathers were largely on the farm or in local industries, the occupations of women were almost exclusively in the home, and a multitude of household tasks and home or farm "chores" provided excellent opportunity for the participation of children in the activities of the family. Since that time the tendency has been strongly in the direction of home conditions in the city, the factory system has removed most of occupational stimuli from the home, women have entered industries and occupations never thought of a half-century ago, and modern labor-saving devices have removed the majority of home activities for boys and greatly lessened those for girls. The result has been that the sense of social responsibility developed by necessary participation in the activities of the family in former times has not been developed in the children of the family within recent years, individual privileges have been extended with the increase of leisure and the increase of opportunities for utilizing that leisure, parents and children spend less and less of their time in close association with a resulting loss of intimate relation, and the primary agency for the development of ideals and habits of social duties and responsibilities has lost opportunities for social training that it can never fully recover. To this we may add the fact that parents themselves not well educated in some respects find greater and greater difficulty in preparing their children for the needs of modern life, a fact which is particularly pertinent in the cases of large numbers of foreign-born parents.

Obviously the burden thrown on the school by the decreased influence of the home in these respects affects all divisions of education, including secondary education. It is in part the basis of the present demand for increased attention to the moral and social education of boys and girls, a demand which cannot be neglected without distinct loss to our efficiency as a nation.

(2) *Changes affecting vocational education:* With respect to stimuli and opportunities for vocational education no less important changes have taken place in the development of the home and family life within the past three or four generations, those changes constantly tending to decrease the amount of vocational stimuli and opportunity offered in that institution. To illustrate the changes which have taken place in this connection and in connection with the preceding paragraphs we cannot, perhaps, do better than quote from Dewey's description made a decade ago:

> Back of the factory system lies the household and neighborhood system. Those of us who are here to-day need to go back only one, two, or at most three generations, to find a time when the house-

hold was practically the center in which were carried on all the typical forms of industrial occupation. The clothing worn was for the most part not only made in the house, but the members of the household were usually familiar with the shearing of the sheep, the carding and spinning of the wool, and the plying of the loom. Instead of pressing a button and flooding the house with electric light, the whole process of getting illumination was followed in its toilsome length, from the killing of the animal and the trying of fat, to the making of wicks and dipping of candles. The supply of flour, of lumber, of foods, of building materials, of household furniture, even of metal ware, of nails, hinges, hammers, etc., was in the immediate neighborhood, in shops which were constantly open to inspection and often centers of neighborhood congregation. The entire industrial process stood revealed, from the production on the farm of raw materials, till the finished article was actually put to use. Not only this but practically every member of the household had his own share in the work. The children, as they gained in strength and capacity, were gradually initiated into the mysteries of the several processes. It was a matter of immediate concern, even to the point of actual participation.

We cannot overlook the factors of discipline and of character-building involved in this: training in habits of order and industry, and in the idea of responsibility, of obligation to do something, to produce something, in the world. There was always something which really needed to be done, and a real necessity that each member of the household should do his own part faithfully and in coöperation with others. Personalities which became effective in action were bred and tested in the medium of action. Again, we cannot overlook the importance for educational purposes of the close and intimate acquaintance got with nature at first hand, with real things and materials, with the actual processes of their manipulation, and the knowledge of their social necessities and uses. In all this there was continual training of observation, of ingenuity, constructive imagination, of logical thought, and of the sense of reality acquired through first-hand contact with actualities. The educative force of the domestic spinning and weaving, of the saw-mill, the grist-mill, the cooper shop, and the blacksmith forge, were continuously operative.[1]

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[1] Dewey, J., *The School and Society*, pp. 22–24. Quoted with the permission of the publishers, University of Chicago Press.

Many factors have combined to remove such vocational stimuli and opportunities from the home: (*a*) the development of organized industry and the factory system; (*b*) the application in the home of labor-saving devices; (*c*) the development of more complicated and scientific methods and processes in industry (e.g., scientific methods in farming), for which the ordinary activities of the home and community can provide but inadequate training; (*d*) the lessened self-sufficiency of the home for its own needs; (*e*) the tendency toward urbanization introducing in some ways a more simplified, in other ways a more complicated life; (*f*) the decrease of "trade heredity" from father to son, or even from mother to daughter.

The lessened influence of the home in vocational training calls for increased attention to that form of education either in the school or in some other social institution. It will be shown in a later section that industry and the vocation itself does not adequately provide vocational training. The only other available institution for that purpose is the school. It is obvious that the great burden of this vocational training must be provided in the secondary division of the system of education.

(*3*) *Changes in the relation between the home and the school*: Not only is it true that changes in the home itself have imposed responsibilities on the secondary school but it is also true that the relation between the two institutions has changed to such an extent that the school must assume certain responsibilities before appropriate to the home. This arises from the fact that the school has preëmpted a much greater amount of the time of the child, thus necessarily limiting the amount of education which the home can afford. This is true in two respects. While the length of the school day has not noticeably, if at all, been increased (it has sometimes worked in quite the opposite direction), the control of the pupils' time through the supervision of extra-curricula activities and home study has markedly increased. Likewise the number of individuals involved has very decidedly increased within the past two decades with great resultant increase in the aggregate of the control of the time of the youth in the secondary school. Thus not only does the home commonly fail to afford opportunity for education to the extent it did a generation or two ago, but, even were the desirable educational stimuli and opportunities to be found in the home, their effectiveness would be reduced because of the lessened contact with the child. The school which has itself reduced the opportunity for education in the home must meet its resulting responsibilities.

To these considerations may be added the fact that the trend of the development of community life has been such as to destroy to some extent the intimate contact which formerly existed between the home and the school. Hence the development of numerous movements such as parent-teacher associations and the high-school-as-the-civic-center movement to promote a closer coöperation between the two institutions.

147. **Changes in community life.** Closely allied to changes in the home and family life affecting education are changes in the community life which have within the past few generations affected the character of secondary education in important ways. Without attempting to draw any sharp dividing line between family life and community life on the one hand and between community life and the more extended functions of the State and society as a whole on the other hand, we may gain a knowledge of some forces affecting education by noting certain changes in community life. Among the most important changes which have occurred within recent times we may consider the following: the change from the small community in the country to the

city community; the increasing heterogeneity of population in communities; the mobility of labor and population.

(*1*) *Changes tending toward urbanization*: One of the most noticeable and one of the most important social changes which have taken place in this country within the past half-century is the increased tendency for the population to congregate in the cities and to withdraw from the rural communities. This tendency is clearly seen from the figures presented in the following table.

TABLE CXVI. THE DISTRIBUTION OF URBAN AND RURAL POPULATION IN THE UNITED STATES IN 1880, 1890, 1900, 1910 *

Division of the country	*1880*		*1890*		*1900*		*1910*	
	Urban (per cent)	*Rural (per cent)*	*Urban (per cent)*	*Rural (per cent)*	*Urban (per cent)*	*Rural (per cent)*	*Urban (per cent)*	*Rural (per cent)*
New England	68.7	31.3	75.8	24.2	79.9	20.1	83.3	16.7
Middle Atlantic	49.9	50.1	57.7	42.3	65.2	24.8	71.0	29.0
East North Central	27.5	72.5	37.8	62.2	45.2	54.8	52.7	47.3
West North Central	18.1	81.9	25.8	74.2	28.5	71.5	33.3	66.7
South Atlantic	15.1	84.9	19.5	80.5	21.4	78.6	25.4	74.6
East South Central	8.4	91.6	12.7	87.3	15.0	85.0	18.7	81.3
West South Central	12.2	87.8	15.1	84.9	16.2	83.8	22.3	77.7
Mountain	23.6	76.4	29.3	70.7	32.3	67.7	36.0	64.0
Pacific	36.2	63.8	42.5	57.5	46.4	53.6	56.8	43.2
UNITED STATES	29.5	70.5	36.1	63.9	40.5	59.5	46.3	53.7

* *Report of the Thirteenth Census* (1910), vol. I, p. 57. Urban communities include all over 2500 population: rural communities include all others.

What are the implications of such conditions for education? The answer to this question calls for the direction of our views along two different lines. In the first place, it is a pertinent theory that the failure of the school to meet community needs has itself contributed toward present conditions which are not altogether desirable, through its failure to adapt itself to the needs of the smaller community and by providing the sort of an education which has tended to drive country children to the cities instead of providing an education suited to the needs of rural life. In so far as such a theory is valid (and it is valid within limits only) the implication for education is an extended adaptation of the character of school education to the diversified needs of different communities.

In the second place, it must be recognized that the tendency toward greater urbanization has resulted in the loss of important forms of social-civic, vocational, cultural, and physical education previously provided informally by community life, forms of education which must now be taken over in part at least by the school. Here we may note particularly the greatly lessened opportunities for social and physical development through play in the modern city as compared with opportunities afforded in the rural community or small town, the loss of rather direct and intimate contact with all the activities of civic agencies, the loss of close contact with industrial activities, the loss of the influence of a sense of social and individual responsibility where one's every act is known by the entire community, and the diminished sense of belonging to a definite social unit.

(2) *The increasing heterogeneity of population in communities:* As is the case for the country as a whole so it is the case for communities (especially for towns and cities) that the population has tended within the past few generations to become more and more heterogeneous, and consequently the unity of life in communities has constantly diminished. Hence it is that the general stimuli of life in any given community have tended to become less and less adequate for the social-civic education of the children of that community with the result that a further responsibility for increased attention to that form of education has been imposed on the school. Where this heterogeneity of population has been accompanied by an increased diversity of industries, as is

not infrequently the case, further implications for vocational education in the school are found.

(3) *The mobility of labor and population:* Important for questions of social-civic and vocational education is the fact that labor and population has tended on the whole to become more mobile. Increased facilities for transportation and the extension of the labor market have made a change of residence from one community to another much more common than formerly. At the same time the breakdown of the older apprentice system has operated to reduce the tendency of the workman to remain in any one community. Thus, in the year 1912–13, from a study of the fathers of 22,027 boys thirteen years of age in the schools of seventy-eight American city school systems, Ayres secured the data presented in the following table.

TABLE CXVII. BIRTHPLACES OF BOYS AND THEIR FATHERS IN SEVENTY-EIGHT CITIES *

Birthplace	*Boys*		*Fathers*	
	Number	*Per cent*	*Number*	*Per cent*
Same city	12,699	58	3,601	16
Same State but not same city	4,233	19	5,349	24
Other State in United States	3,069	14	4,364	20
Foreign country	2,026	9	8,713	40
Total	22,027	100	22,027	100

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* Ayres, L. P., *Some Conditions affecting Problems of Industrial Education in Seventy-eight American School Systems.* Bulletin E. 135 of the Russell Sage Foundation, p. 7.

The data giving the birthplaces of the boys and their fathers show that only about one father in six is now living in the city of his birth and that among the boys only a few more than one-half are now living where they were born. These facts are significant because it is often urged that the schools should develop courses of industrial education that will directly prepare the children to enter local industries. But if present conditions maintain in the future the great majority of adults are not going to work in the same communities in which they received their schooling.

It is clear that the conditions illustrated by Ayres's investigation are significant not merely for problems of vocational education but also for other forms of education.

148. Changes in the Church and religion. The Church has always been one of the most conservative of social institutions. As a result of that conservatism such changes as have taken place have meant: (*a*) a splitting-off of new denominations or sects from the parent institution; (*b*) a decrease or increase in the number of active adherents of the Church or of various denominations; (*c*) an increase or decrease in the influence which the Church and its religion exercised over its adherents. Changes along these lines have not been without importance for education in this country within the past few generations, though their extent is very difficult to determine.

The *World Almanac* for 1917 lists forty-nine different denominations with one hundred and seventy-one different sects in the United States. How far the Church and religion have lost unity through the development of numerous denominations and sects it is impossible to estimate. This much, however, is sure, that the power of the Church as an integrating factor in American society has diminished in some degree even within the past few decades and in some communities it must be recognized that social unity is seriously imperiled by denominational discord.

Even more difficult to measure is the result of changes in the number of Church communicants and the real influence of the Church and its religion over those communicants. This much appears clear, however, that religion has ceased to exert the extent of influence which it formerly exerted in certain directions for the people of America as a whole. Instances of such a loss of influence may be found in the disappearance of family prayers in many homes, the observance of the Sabbath, the position of the Church as the community center, the lessened influence of the clergy. Extension of the activities of the Church in other directions has by no means recovered the influence which the Church once had. This has meant a distinct loss to education. If the loss were one merely of theological and ritualistic education it would not be so important. The great loss has been in moral and social education which have always been closely associated with religious education, and in the diminished power of one of the greatest of integrating factors.

The implications for education arising from such changes in the Church and religion are recognition of the added responsibility for moral-social education in the school and recognition of the need for the school to assume added responsibility for its integrating function.

In this connection it should be noted that acceptance of the principle that Church and State education must be separate in this country and that religious instruction cannot be provided in the public school has had the natural result of fostering denominational and sectarian schools, a result which was probably inevitable, but one which, if extended far, must inevitably lead to a direct conflict of educational policy.

149. **Changes in the vocation.** The nineteenth century was distinctly a period of industrial change if not industrial revolution in this country as well as for civilized society in general. Within that period came : (*a*) the greatly extended application of science to industry; (*b*) the substitution of machinery for hand labor; (*c*) the substitution of the factory system for the domestic system of industry; (*d*) the extension of industrial competition; (*e*) the development of organ-

ized labor; (*f*) the growth of highly specialized processes and the greater subdivision of labor; (*g*) the consequent breakdown of the older apprentice system; (*h*) the entrance of women into industry; (*i*) a change, particularly in this country, in the relative importance of industrial efficiency and abundant natural resources as determining economic values; (*j*) a more intimate relation between government and industry; (*k*) the development of a tendency toward materialism in thought and life; (*l*) the development of an industrial democracy; (*m*) the development of labor legislation, especially as affecting the occupations of women and children, as affecting the hours and conditions of labor, and as affecting the age of entrance into industry.

All these and other changes which have taken place within the past few generations in the field of the vocation may be grouped on the basis of their educational significance under one or more of the following main heads: (1) changes in the amount and character of vocational education provided by the vocation itself and by the system of industry; (2) changes in the requirements of the vocation and the conditions for entrance; (3) changes in the amount and character of non-vocational education provided by the vocation and by the system of industry, especially moral-social education.

(*1*) *Vocational education through the vocation:* The disappearance of the older apprentice system which provided for the vocational education of the boy or girl in and through the vocation itself, the development of the factory system of industry which removed the field of industry from the home and smaller community where the boy and girl came into more direct and intimate contact with it and which itself provided a greatly lessened training for those who entered industry the development of highly subdivided processes in any given trade which has made it possible and economical for the individual to become acquainted with a single small part only of any total trade or even any total process — all these and other changes have greatly diminished the amount of vocational education formerly provided by the vocation itself and have greatly modified the character of such education as is still provided in industry.

(2) *Requirements of the vocation and of industry:* The development of industrial competition and its extension to international competition has created a demand for a higher degree of industrial efficiency than was ever before necessary. In this country heretofore the abundance of natural resources has afforded an advantage which in industrial competition has left a margin permitting wasteful use of natural resources and a certain amount of industrial inefficiency. That margin must constantly grow less, and even if that were not the case, it is probable that the wasteful methods of the past would not long survive the strenuous competition of modern industry. Thus industry has increased its demand for higher efficiency, implying better industrial training at the same time that the vocation itself and industry has decreased the opportunities which it formerly provided for such training.

At the same time practice and legislation have constantly extended the age at which boys and girls enter on their vocations, thereby reducing the possibility of early vocational education in industry itself. In particular child-labor laws and compulsory school-attendance laws have taken the child out of the environment wherein vocational stimuli and vocational education were provided. It is imperative that the school should in some degree provide for equivalent preparation for the vocation.

(3) *The vocation and moral-social education.* It is a serious error to think the changes in the vocation and in industry are of importance in connection with vocational education and industrial efficiency alone. Such changes are fully as

significant in connection with moral-social education, a fact which is readily recognized when we consider the extensive development of the relations between labor and capital, the important part played by organized labor in industry, in government, in politics, and in the ordinary conduct of everyday life, when we consider the effect of the modern factory system on the individual worker and on home and community life, and when we consider the relations of producer and consumer under existing conditions. The high ethical standards of artizanship and of industrial responsibility were greatly diminished when the relation between producer and consumer became less direct, when highly divided industry came to prevent the individual worker from seeing the relation of his particular piece of work to the finished total product as well as the relation of that complete product to society's needs, and when the relation between the laborer and the employer became less and less close.

The implications for education of changes in the vocation and in industry are perhaps primarily concerned with the need for recognition of the importance of vocational education and direction in the work of the school. By no means negligible, however, are the implications for social and moral education.

PROBLEMS FOR FURTHER CONSIDERATION

1. Show how differences between secondary education in Germany, France, England, and America manifest the influence of differences in dominant social ideals and the form of social organization.
2. Show how social ideals in America changed during the nineteenth century and how the influence of those changes affected secondary education.
3. Make as large a list as you can of civic duties and responsibilities at present required but not required a decade ago. How far did secondary education of a decade ago prepare for such duties and responsibilities?
4. Compare the opportunities for amusement afforded when you were

a pupil in the secondary school with those now afforded. How far did your secondary school education prepare you for the intelligent enjoyment of facilities for amusement? How could it have been bettered?

5. In what ways can a capacity to readjust to the changing conditions of society be developed in the public secondary school?
6. What are some of the important problems for secondary education arising out of the factors of integration and differentiation in society?
7. Make a list of all the stimuli and opportunities for social-moral training formerly found in the home and community life and no longer afforded by those institutions. Which of those can be partially replaced by secondary education?
8. Make a list of all the stimuli and opportunities for vocational education formerly provided in the home and community life and no longer afforded by those institutions. Which of those can be partially provided in the secondary school?
9. Make a list of all the stimuli and opportunities for moral-social education formerly provided by the vocation and industry and no longer provided by those agencies.
10. Trace the decay of the older apprentice system and consequent demands on secondary education.
11. In what ways has the industrial development tended to require more extensive education for workers? In what ways has it tended to require less education?
12. What factors have tended to emphasize the need for more attention to moral education in the secondary school?
13. What factors have tended to emphasize the need for more attention to social education in the secondary school?
14. What factors have tended to emphasize the need for more attention to vocational education in the secondary school?
15. What factors have tended to emphasize the need for more attention to physical education in the secondary school?
16. What factors have tended to emphasize the need for more attention to education for the utilization of leisure in the secondary school?
17. What factors have tended to emphasize the need for more attention to educational guidance in the secondary school?

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CHAPTER X

THE AIMS AND FUNCTIONS OF SECONDARY EDUCATION

I. THE AIMS OF SECONDARY EDUCATION

150. The aims of secondary education: their basis. The key to any analysis of aims in education is to be found in an analysis of the activities of life in which people do or should engage. The aims of secondary education, therefore, as of any department of education, must be interpreted in terms of the activities in which individuals may be expected normally to participate. Obviously those activities vary in different societies and at different periods. Obviously also different individuals and different groups of individuals engage in various activities in various ways and to varying degrees. Any complete analysis of the activities in which different individuals and different groups engage would involve an examination of all the multitudinous phases of human life. Such a detailed analysis is, of course, impossible: if it were possible it would be of questionable value, since it would deal with individuals whose lives could not be prophesied. Certain general fields of activity, however, engage practically all individuals in some way and to some degree, furnishing fundamental aims for secondary education.

151. Three fundamental aims of secondary education. Three important groups of activities require the participation of the individual and establish three fundamental aims for secondary education, as for all education, in America. Those three groups of activities are distinguished accordingly as they involve primarily: (1) participation in the duties of citizenship and in the not-directly economic relations of coöperative group life; (2) participation in the production and distribution of economic utilities; (3) the life of the individual as a relatively free and independent personality. Thus the three fundamental aims of secondary education are:

(1) The preparation of the individual as a prospective citizen and coöperating member of society — the Social-Civic Aim;

(2) The preparation of the individual as a prospective worker and producer — the Economic-Vocational Aim;

(3) The preparation of the individual for those activities which, while primarily involving individual action, the utilization of leisure, and the development of personality, are of great importance to society — the Individualistic-Avocational Aim.

It must be recognized that these three aims are not mutually exclusive, but rather that they are in a high degree interrelated and interdependent. Taken together they constitute the Social Aim of secondary education in the broadest sense of the term. Every individual as a social unit is at the same time a citizen, a worker, and a relatively independent personality. The three phases of his life cannot be divorced, and in the secondary school preparation for no one of those phases of life should be neglected.

152. The social-civic aim. The social-civic aim of secondary education involves the preparation of individuals for efficient participation in those activities of society whose controlling purpose and primary object are desirable forms of social coöperation, e.g., the interrelated activities of people in community life, in making laws, in action according to laws, in political duties, and in general wherever group action and the not-directly economic relations between the individual and the group or between individual and individual are involved. Hence it demands the development of knowledge, habits, abilities, and ideals which will enable the individual efficiently to play his part as a social unit in group activities.

Adequate preparation for and training in such social activities as are involved in the social-civic aim of secondary education must include among others at least the following purposes: (1) the development of ideals and habits of conduct; (2) the development of ideals and habits of coōperation; (3) the development of a knowledge of important social institutions or agencies and their place in the social order, together with appropriate ideals, standards, and habits; (4) the development of a knowledge of the civic activities involved in community life, together with the related ideals, standards, and habits; (5) the development of a knowledge of the major activities of state and national life, together with appropriate ideals, standards, and habits; (6) the development of a knowledge of political principles and duties, together with appropriate ideals, standards, and habits; (7) throughout all secondary education, as far as may be possible, training in social activities through actual participation in the activities of the school itself and the community; (8) throughout all the development of a social conscience or sense of social responsibility.

Important in any society, the social-civic aim is obviously most important in a democracy.

153. **The economic-vocational aim.** The economic-vocational aim of secondary education involves the preparation of the individual for efficient participation in those activities of society whose controlling purpose and primary object involve economic efficiency. Society makes its demand on every individual to participate in economic activity

at least to the extent of "pulling his own load," and economic efficiency is a necessity of modern life to which each must contribute his share. So universal a necessity cannot be neglected by the secondary school unless it can be shown that other social agencies are equal to the task of such preparation. That other social agencies do not accomplish such preparation adequately has been indicated in the preceding chapter. The responsibility, therefore, falls on the school and must be recognized in the aims of secondary education.

As long as pupils receiving the benefits of secondary education were drawn from classes whose vocations were almost entirely the higher professions, involving vocational education in higher institutions, the directly vocational aim in the secondary school was subordinated to other aims except in so far as preparation for higher institutions might be conceived as involving indirect contribution to a vocational aim. With the extension of the benefits of secondary education to the non-professional classes greater importance has necessarily been attached to the economic-vocational aim.

Adequate preparation for and training in such activities as are involved in the economic-vocational aim of secondary education must include, as far as may be possible and with due reference to the different needs of special groups, the following purposes: (1) the development of the knowledges, skills, and habits involved in vocational activities; (2) some knowledge of the principles of economics; (3) some development of the ideals, standards, and conditions of the economic world; (4) the discovery and development of special interests and aptitudes of different individuals for vocational pursuits; (5) some vocational guidance; (6) the development of an understanding of the significance of various vocations to society; (7) the development of a conception of the relations between fellow-members of a vocation, between different vocational groups, between employee and employer, between producer and consumer; (8) some knowledge of industrial-governmental relations.

The degree in which vocational education and training may be appropriate for various groups of pupils in the secondary school obviously must differ. More uniformity is possible in the attainment of the social-civic aim than in the economic-vocational aim, since the activities involved in the former are more nearly the same for all individuals. The greater difficulty of attaining the economic-vocational aim is, however, no justification for its neglect in the secondary school.

154. The individualistic-avocational aim.[1] The individualistic-avocational aim of secondary education involves the preparation of the individual for those activities of life whose primary object and controlling purpose are personal development and personal happiness through the worthy use of leisure. The social-civic and the economic-vocational aims of education are directly and constructively social. Their contributions to social well-being and to social progress are obvious. On the other hand, the individualistic-avocational aim of education is sometimes falsely conceived to be non-social. This is a serious error arising in large part from the fact that its contributions to social well-being and to social progress are, in a sense, indirect and to some extent negative. For centuries academic asceticism has frowned upon any kind of education which frankly or in disguised form favored varied opportunity for the development of personality and for the enjoyment of leisure. Since the individualistic-avocational aim of education deals primarily with the leisure part of life its importance is constantly minimized by educational theorists. Thus Spencer, identifying preparation for leisure with preparation for the refinements of life, says:[1]

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[1] The terms "culture" and "cultural" are purposely avoided here because of their ambiguity in modern educational thought.

> Accomplishments, the fine arts, *belles-lettres*, and all those things which, as we say constitute the efflorescence of civilization, should be wholly subordinate to that knowledge and discipline in which civilization rests. *As they occupy the leisure part of life, so should they occupy the leisure part of education.*

The following considerations suggest that such a conception is fallacious.

(1) Preparation for the leisure part of life is very far from being confined to "accomplishments, fine arts, *belles-lettres*," and preparation in such fields would be far from adequate for the proper utilization of leisure, were it possible to provide such training for all. The average individual has from one quarter to one fifth of his time for leisure. His action during leisure is as much a matter of social concern (at least in a negative sense) as his action in any other part of his life. Within recent years there has been a constant tendency to increase the amount of leisure time at the disposal of the individual. That increase in the amount of leisure has introduced problems of no slight importance for secondary education.

(2) While the individual's activities during his leisure time are not designed primarily to make positive contributions to social well-being and to social progress and while they do not tend on the whole to build up society, unless directed along desirable social lines they may and doubtless do tend to interfere seriously with that process, or even, in some cases, to tear civilization down. Vice and social degeneration find fertile soil in leisure. The social menace of the activities of leisure not well guided, where standards, habits, and ideals have not been established along desirable social lines, is by no means slight or unimportant. Let the leisure

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[1] Spencer, H., *Education*, chap. I (Burt edition), p. 68.

time of any society be well controlled and there is little danger that such a society will not endure and prosper. Let the leisure time of any society be neglected or misused and there is little hope that it will prosper.

(3) The conditions of modern industry have tended (*a*) to allow the worker an increased amount of leisure time, and (*b*) to reduce the stimuli and opportunities for personal development and personal enjoyment in and through labor itself. Factory labor has tended to reduce the economic activity of the worker to a level of deadening monotony where either development or enjoyment is reduced to lowest terms. In some way those stimuli and opportunities for personal development and personal enjoyment must be provided in modern life.

(4) It is altogether probable that in this country the time is rapidly approaching, if indeed it has not already arrived, when conditions of labor cannot continue to decrease the ultimate efficiency of the worker by failing to allow sufficient leisure for re-creation through recreation. It remains to be seen whether or not the increased leisure and the extended opportunity to utilize leisure may not seriously impair the social efficiency of our society, if greater preparation for the intelligent and sane use of leisure is not provided.

Legitimate fields for the carrying-out of the individualistic-avocational aim of secondary education may well include, among others, the following: (*a*) the development of a sense of social responsibility for individual action, even where the primary object is legitimately personal development and personal enjoyment, i.e., a respect for the rights and interests of others; (*b*) the development of tastes and standards for enjoyment and the use of leisure — moral and æsthetic, e.g., in reading, in the theater, in physical recreation, etc.; (*c*) the development of self-sustaining habits of amusement along desirable lines — the development of interests, hobbies, etc., which may prevent one from sinking to grosser pleasures through a lack of higher interests; (*d*) a knowledge of certain pleasure evils and their results; (*e*) the development of pleasure interests, where possible, which are at the same time social benefits and means of personal enjoyment.

155. **The interrelation of the three aims.** It has already been suggested that these three aims of secondary education are not mutually independent, but rather are interrelated and interdependent, since they represent but three different phases of life which concern each individual. Historically the necessary interrelation of the three aims has not always been properly recognized, with the result that some one of the aims has been emphasized to the neglect or under-valuation of the others. Thus neglect or insufficient attention to the economic-vocational aim in the past is recognized by those familiar with the history of education. Its over-emphasis is not impossible in some cases at the present time. Thus the individualistic-avocational aim has received more than its just due at some times in the past. Its neglect is a possibility in some cases at the present time. The possibility of separating the three aims for purposes of objective analysis should not lead to the assumption that they can be separated in the case of any individual's education. No form of secondary education which fails to provide adequately for all three forms of activity can be considered satisfactory.

156. **Aims based on traits involved.** In the preceding discussion the aims of secondary education have been considered in terms of the activities involved in life. Efficient participation in those activities depends on the employment of physicial, mental, moral, and æsthetic traits which must be developed in individuals. Hence the attainment of the aims set is conditioned by the development of physical effi-

ciency, mental efficiency, moral efficiency, and æsthetic efficiency of pupils. These four elements may be conceived as objectives of education cutting cross-sections through each of the social aims formulated above, no one of which is attainable without their development. With whichever of the two sets of aims one starts he is bound soon to reach and consider the other. The more promising approach, however, is the social.

II. THE FUNCTIONS OF SECONDARY EDUCATION

157. The functions of secondary education. For present purposes the term "functions" is employed to designate certain elements for which secondary education must provide if the aims previously formulated are to be attained. Those functions are determined in part by the nature of society and in part by the nature of the pupils to be educated, factors which in important ways condition the attainment of the aims set. If we conceive of the aims of secondary education as the ultimate goals which it is to attain we must recognize that certain factors must be involved in the attempt to reach those goals. Thus we may conceive of the social-civic aim of secondary education as involving preparation for efficient participation in social-civic life. Many important functions are therein involved, e.g., means of adjusting the individual and his social environment, the development of a "social mind" and social cohesion among groups of individuals, the adjustment of individual differences to the differentiated needs of society, control of the factor of selection in secondary education, educational, moral, social, and vocational guidance.

The remaining sections of this chapter will deal with the following six important functions of secondary education: (1) the adjustive or adaptive function; (2) the integrating function; (3) the differentiating function; (4) the propædeutic function; (5) the selective function; (6) the diagnostic and directive function. Their relation to the aims of secondary education will appear more clearly from the following discussion.

158. The adjustive or adaptive function. It is a postulate of the social aim of secondary education that it should provide means for the adjustment of the pupil to his social environment. In section 143 (Chapter IX) it was maintained that the social environment to which the secondary-school pupil is to be adjusted is dynamic, not static, and that the rapidity of social change is so great as to warrant the assumption that the social environment in which the present pupil is later to live will in important respects differ from that of the present. The course of social evolution shows clearly that for any one generation the total social organization represents a composite of relatively stable and constant elements of the past and certain elements appropriate to the present. It also implies that the present social organization comprises certain elements which may be expected to remain relatively stable and constant in the near future, and others which we may confidently expect to be either entirely lost or radically modified. This suggests that mere adjustment through the development of relatively fixed habits of reaction is fairly adequate for those elements which may be conceived as destined in all likelihood to remain relatively unchanged in their essential characteristics within the life of the present generation. It suggests also, however, that adjustment alone (in the sense of the establishment of fixed habits of reaction) is insufficient, and that some capacity for readjustment must be developed if the individual is to be prepared for the changing conditions which will inevitably come during his life after the period of formal education. In other words, the adjustive function of secondary education includes both the establishment of certain fixed habits of reaction, certain fixed standards and ideals, and also the development of a capacity to readjust adequately to the changing demands of life. *Tempora mutantur, et nos mutamur in illis,* is true with regard to the *times;* it is true of *us* only in a collective sense and to the extent that readaptation is possible.

159. **The integrating function.** In section 144 (Chapter IX) the bearing of the social factors of integration and differentiation on secondary education was discussed. It was there pointed out that one of the imperative demands made by society on the secondary school is provision for the development of that amount of like-mindedness, of unity in thought, habits, ideals, and standards, requisite for social cohesion and social solidarity. From this arises the integrating function of secondary education, which in this country particularly is constantly acquiring greater and greater importance for a number of reasons. Among these may be mentioned the following:

(1) The increasing complexity of life in a modern democracy constantly increases the amount of common knowledge, of common action, and common ideals necessary. The elementary school is constantly becoming less and less adequate for this need.

(2) The increasing heterogeneity of the population in this country tends constantly to increase the diversity of social heredity and therefore to render the process of social integration more necessary and more difficult.

(3) The increasing diversity of industrial occupations and of living conditions tends constantly to increase the forces of differentiation demanding increased forces of integration to balance and compensate.

(4) Other institutions which formerly operated as integrating agencies have been modified in such a way as to

operate with diminished force in that direction or have proved quite inadequate for that purpose under the changed conditions of society: e.g., the Church and religion.

To conceive that the factor of integration is of importance in connection with problems of "class distinction" only is an error. Important as those problems are for a democracy they involve but a part only of a more fundamental problem including other problems of social integration.

160. **The differentiating function.** The integrating function must at all times be conceived as correlated with the differentiating function of secondary education and the relation between the two functions must be considered as supplemental rather than conflicting, the supplemental relation being necessitated by the relation of the two factors of integration and differentiation in the process of social evolution. As the integrating function of secondary education arises out of the necessity of developing a certain amount of homogeneity out of the heterogeneous population for the purpose of assuring social solidarity, so the differentiating function of secondary education arises out of the necessity of taking advantage of the differences among individuals for the purpose of determining social efficiency.

Two facts make this differentiating function in secondary education both possible and necessary:

(1) Pupils in the secondary school (the raw material with which secondary education must perforce deal and which conditions its operation) differ greatly in native capacities, in acquired tendencies (especially as conditioned by training outside the school), in interests and aptitudes. Failure to recognize this fundamental fact at any time must inevitably mean failure to do justice to the individual and failure to develop the highest social efficiency out of the raw material available.

(2) The diversified needs of modern industrial and social

life demand preparation for widely different forms of activity which cannot be provided for all individuals. Moreover, if such universal preparation were possible, it would be extremely wasteful and undesirable. The differentiated activities of life demand differentiated education, the burden of which, as far as formal education is concerned, must be borne by the secondary school.

161. The propædeutic function. The propædeutic function of secondary education is merely one phase of the adjustive function, having reference to a part only of secondary-school pupils — those preparing to continue their formal education in some higher institution. Preparation for such higher education cannot be considered as a separate aim of secondary education. It must be considered, however, as a legitimate function of secondary education in the case of those pupils whose preparation for the attainment of the ultimate aims of education may be extended over a longer period of time than that of the great majority. The general aims of the education of such pupils remain the same aims formulated above, namely, the social-civic aim, the economic-vocational aim, and the individualistic-avocational aim.

A number of factors, however, affect the attainment of those aims in the case of the pupils who will continue their formal education in some higher institution. A more intensive and more extensive preparation for the social-civic activities is possible; preparation for vocational activities in its direct and specific form is deferred; different forms of preparation for different modes of leisure are possible and justified; a somewhat higher selection of pupils is common, at least with reference to social and economic status. As the activities of such pupils will "function" differently in life after the period of formal education, so must the function of secondary education differ somewhat in the case of such pupils.

Common practice tends either to over-estimate or to under-estimate the propædeutic function of secondary education. In the past this function has commonly received altogether too much attention, and the rather definite requirements of preparation for higher education have tended to overbalance the whole economy of secondary education in this country until it became the dominant aim of the secondary school instead of occupying its legitimate place as a contributing function. On the other hand, the present revolt against such a domination of college preparation has in some cases led to a gross under-estimate of the importance of the propædeutic function of secondary education. This has already been discussed in section 128, and requires no further consideration here, except, perhaps, to recall the fact that secondary-school pupils destined to continue their formal education in higher institutions comprise the largest roughly homogeneous group of pupils in the public secondary school — homogeneous in the sense that a complete secondary-school course may be mapped out for this group much more readily than for any other group and in the sense that a rather definite and tangible temporary goal may be set up for their education. Whatever be the particular form that the articulation between secondary education and higher education may eventually assume, it must be recognized that preparation for higher education must be one of the legitimate functions of secondary education. Nevertheless it must also be recognized that it is but one of a number of functions.

162. The selective function. Selection is a necessary function of any form of education, the necessity arising from the factor of individual differences which become an increasingly important factor as the course of education proceeds higher and makes a greater demand on capacity. It was pointed out in Chapter III that individuals differ widely in mental traits. In so far as those differences are due to the limits of capacity set by nature and to rates of development also determined by nature it is clear that, as education demands more and more capacity, with certain individuals the limits of their capacity are reached, or, what is more common, the point is approached at which given possible amounts of training produce results incommensurate with the amount of teaching and learning energy expended, and the point of diminishing returns is reached. No amount of training can ever equalize the abilities of individuals whose native capacities differ to any marked degree. Hence selection must inevitably be a function of secondary education.

The selective function of secondary education may be viewed from two somewhat different but related aspects. From one aspect selection is commonly considered as involving the elimination of those individuals who are unable to meet the demands set. To this view little objection could be raised, provided, and only provided, that the demands set could be justified. In the past in this country and at present in some countries the demands set were largely based on the assumption that ability and willingness to meet the requirements of certain specified subjects of study with limited range measure intellectual ability in general — a theory which itself rests on the further assumption that either all desirable mental traits are involved in the specific subjects selected, or the improvement in the mental traits involved can be transferred to other material. Such a theory is discussed in detail in later sections. For the present it is sufficient to state that the theory must certainly be greatly modified and that it cannot justify emphasis on any small number of subjects in the secondary school as affording adequate training for all or as affording a training which is susceptible of unlimited transfer.

In contrast to selection by elimination the second aspect of the selective function of secondary education emphasizes selection by differentiation. Its justification rests on two considerations: (1) that individuals differ in capacities, interests, and the nature of environmental influences, those differences appearing not in the sum total of mental traits, but in the various mental traits as related to each other; (2) that, within limits, training in various specific mental traits or groups of traits is justified from a social viewpoint. In terms of psychology it assumes that different mental traits are found in different individuals in different degrees. In terms of sociology it means that no one subject or group of subjects can claim exclusive place in secondary education and that different subjects or groups of subjects are equally justified from the viewpoint of social economy. In terms of school practice it means that if a pupil lacks ability or interest in one field of study but possesses ability and interest in another, discrimination is justified, and, particularly in the public secondary school, that pupil has a right to receive education in fields for which he possesses ability and interest. He cannot be deprived of the opportunity for education because of inability or lack of interest in some officially favored subject or subjects.

163. The diagnostic and directive function. A phase of the adjustive function, and one closely related to the selective and differentiating functions, is the diagnostic and directive function of secondary education. Social economy and personal efficiency and happiness postulate that each individual, as far as may be possible, should do what he can best do. The determination of what each pupil may best do and what he may do with the greatest efficiency and happiness cannot be accomplished unless he is brought into contact with a somewhat wide range of experiences, in large part through studies in the secondary school. Hence the school must provide materials to acquaint the pupil with various activities of life, must give him some opportunity to test out and explore his capacities and interests, and must provide some direction and guidance therefor. The mere offering of various forms of instruction does not complete the work of the secondary school. It must, as far as may be possible, add to that function the function of exploring, testing, diagnosing, and directing the education of the pupil. It must permit the pupil to discover and test his own special aptitudes and capacities, and must assist in that process through a thoroughgoing system of educational guidance, including educational guidance and direction in the narrower sense, moral guidance, social guidance, physical guidance, and vocational guidance.

PROBLEMS FOR FURTHER CONSIDERATION

1. In this chapter the aims of secondary education have been formulated from the social viewpoint. How would the aims be modified if approached from the individualistic viewpoint?
2. How would a religious aim be related to the aims formulated in this chapter?
3. Compare as many formulated aims of secondary education as you can find. (Cf. the references following, and Ruediger, W. C., *The Principles of Education*, pp. 86–90.)
4. How is moral education related to the social-civic aim of secondary education? (Cf. MacVannel, J. A., *Outline of a Course in the Philosophy of Education*, pp. 99–115; Bagley, W. C., *The Educative Process*, pp. 40–65.)
5. Trace each of the formulated aims of secondary education historically.
6. Consider with reference to secondary education the classification of the activities of life made by Spencer. (Cf. Spencer, H., *Education*, chap. I, pp. 17–22 (Burt edition).)
7. In connection with the adjustive aim of secondary education show how the development of fixed habits of reaction are related to the development of adaptability.
8. Show how the integrating function of secondary education affects the attainment of the social-civic aim. What relation does it have to the other aims?
9. Show how the differentiating function of secondary education is related to the economic-vocational aim. What relation does it have to the other aims?
10. Trace the history of the propædeutic function of secondary education.

11. Compare the operation of the selective function of secondary education in Germany, France, England, and America.
12. What are the present tendencies of the diagnostic function of secondary education in the United States?
13. What are the present tendencies of the directive function of secondary education?
14. What bearing does the relation between the integrating and the differentiating functions of secondary education have on problems of organization in the American secondary school? On the administration of the curriculum and course of study?
15. What bearing does the selective function of secondary education have on the American secondary school?
16. What effects has the neglect of the diagnostic and directive functions had on secondary education in this country?

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PART III

THE MEANS AND MATERIALS OF SECONDARY EDUCATION

CHAPTER XI

THE PROGRAM OF STUDIES — CRITERIA OF SUBJECT VALUES: ANALYSIS OF THE PROGRAM

164. Subject values determined by aims and functions. The value of any subject of study for secondary education is to be determined and measured by the degree in which it may contribute to the attainment of the aims of secondary education and meet the demands of the functions of the secondary school. In the preceding chapter those aims were formulated as: (1) the social-civic aim, involving the preparation of the individual with respect to his social efficiency in the narrower sense of that term; (2) the economic-vocational aim, involving the preparation of the individual with respect to his economic efficiency; and (3) the individualistic-avocational aim, involving the preparation of the individual with respect to the worthy utilization of his leisure time. Hence the value of any subject of study is to be measured according to the degree in which it may contribute directly or indirectly to the attainment of those desired ends, and the aims or purposes of any accepted subject of study in the secondary school are to be determined accordingly.

In the preceding chapter the aims of secondary education were formulated in general terms only, a necessary condition in formulating aims designed to hold at all times and in all places and a necessity resulting from our present lack of social, economic, physiological, and psychological data. Aims formulated in that way can be of service for general guidance only and must be analyzed and interpreted in particular terms before any adequate attempt can be made to measure the specific values of special subjects of study in secondary education. Thus we may set the preparation of the individual as a prospective worker or producer as one essential aim of the secondary school, but before any such preparation can be accomplished with satisfactory results it will be necessary for us to have knowledge of the specific capacities, skills, knowledges, and acquired habits required by the various vocational processes and knowledge of the special abilities, skills, knowledges, and habits which may be developed through the study of various subjects. Likewise with the preparation of the individual for the other activities of life. Needless to say the sciences of sociology, economics, physiology, and psychology in the present stage of their development cannot begin to afford us the necessary data for such purposes and we are forced, therefore, to fall back on more or less empirical analysis of the problem, utilizing the results of accepted special principles of the sciences mentioned where they are available and where such special principles fail falling back on the general principles established in those fields.

In the chapters immediately following the present chapter, analyses of special subjects of study in the secondary school are attempted. In this chapter attention will be devoted to certain general principles underlying the determination of the program of studies. In particular the discussion will concern: I. Direct Values; II. Indirect Values.

I. Direct Values

165. Direct values. By direct values are meant here those values which arise out of the fact that the specific abilities, knowledges, skills, etc., developed in and through a subject of study in the secondary school are directly and immediately applicable in certain phases of activity in life. Thus the elements of skill developed through the study of stenography or typewriting are directly applicable in certain very similar activities outside the school. Thus the use of the mother tongue has direct value. Thus the association $5 \times 6 = 30$ has direct value for life.

Direct values are so obvious that the ready acceptance of them is likely to lead us to overlook certain facts that are involved. It is probable that no subject of study which is a serious candidate for membership in the program of studies of the secondary school is wholly without *some* direct values for the real activities of life. It is obvious, therefore, that the problem must always concern the *amount* of direct value involved. It is obvious also that the amount of direct values found in any given subject must depend on the proportion of all individuals who may find occasion for the application of the abilities, knowledges, skills, etc., developed through the study of a given subject and the number of occasions in which they may apply. In other words direct values are relative, a fact obvious enough and yet a fact which has frequently been ignored by educational experts and one which is seldom recognized by teachers and pupils. Several misconceptions arising out of a failure to recognize the relativity of direct values are important enough to require special consideration.

(1) One fallacy very common in educational theory and practice arises out of the failure to recognize a distinction between (*a*) fields of knowledge or skill which are of inestimable value to society and to civilization in their extended development through relatively few specialists, and (*b*) fields of knowledge or skill which are directly valuable for all or a majority of individuals. In arguments for the direct values of many subjects (especially the material sciences) the advocates of those subjects of study for the secondary school constantly emphasize the great contributions which those sciences have made to the advance of society and civiliza-

tion and tend to ignore the fact that those contributions have always come through the specialist. The fallacy involved is one of the most important of the numerous fallacies found in the analysis of subject values made by Spencer in his essay on "What Knowledge Is Of Most Worth?" One may readily grant the values of any given science for society and the necessity of a knowledge of that science on the part of some individuals for the advantage of all individuals, without thereby accepting the theory that all individuals should receive training in that science.

(2) Closely related to the first fallacy considered above is a second common fallacy which consists in a failure to distinguish between values of production and values of consumption, between values of accomplishment and values of utilization. Many subjects of study which are of almost universal value from the viewpoint of a development of efficiency in consumption, utilization, and appreciation, have but very restricted value from the viewpoint of a development of efficiency in production and accomplishment. Thus it is a fact that all individuals must to some extent utilize the force of electricity and the ability to utilize the results of the science dealing with electricity is required of all individuals so that some universal values follow. This does not mean, however, that all individuals must be acquainted with the science of physics or even that part which deals with electricity any more than they need acquaintance with the subject of physics in order to apply the mechanics involved in walking. We may assume that nearly every individual is affected by the use of electricity directly in a large number of his everyday activities through the utilization of the electric light, the electric car, the telephone, telegraph, and a multitude of other applied forms of that force. It is to be noted, however, that such utilization requires nothing more than such simple kinds of knowledge

and skill as are involved in pushing a button for light, paying one's fare on the car, avoiding "live" wires, using the telephone receiver and transmitter, writing out a telegraphic message, etc. — abilities which demand no extensive study of physics and which, as a matter of fact, have less to do directly with electricity than with other kinds of knowledge and skill. Expertness in production or accomplishment, in technical knowledge of processes, is not a necessary condition of expertness in consumption, or utilization, or appreciation, and the universality of use, consumption, or appreciation is no measure of universality of production, technical knowledge and skill, or accomplishment. All people wear shoes and it is necessary that every individual should have some knowledge of the way in which shoes should be worn or what may be expected of shoes in the way of looks and wear. It would be absurd, however, to measure the importance of a knowledge on the part of all people of the production of shoes by the importance of their use, and it is just as absurd to measure the values of subjects of study (as far as direct values are concerned) in terms of the universality of the use or consumption of their products. What all people use they need to be trained how to use to the extent only of their actual use. For efficient use, however, no extensive study of most fields of knowledge is requisite for most people.

(3) A third fallacy not infrequently found is one which involves a failure to distinguish between certain and contingent values, a failure to recognize the relativity of values based on the probability that circumstances will occur in the lives of given individuals where specified kinds of knowledge or skill may be of service.[1] Studies which may be of great value to individuals on the contingency that they come into

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[1] The distinction is well drawn by Young, J. W. A., *The Teaching of Mathematics*, pp. 13–14.

contact with unforeseen situations, may be of little value unless they actually meet with those situations. The direct values of the study of secondary-school mathematics or foreign languages are highly contingent for the majority of pupils at present engaged in their study.

(4) A fourth fallacy frequently found in estimating the values of most subjects of study in the secondary school involves a failure to distinguish between the values attaching to certain parts only of any given subject and the values attaching to the whole related field of knowledge as organized into a logical system. The fallacy arises somewhat as follows: element A is recognized as possessing universal values for direct application in life: element A belongs to that field of organized knowledge which goes under the name of English, mathematics, science, etc.: On this basis English, mathematics, science, etc., is introduced into the program of studies. Once introduced a multitude of other elements (B, C, D, E, etc.) are introduced under the general subject title and values attached to them which may belong legitimately to element A alone. In so far as element A depends for its functioning on the other elements involved such a process may be justified within limits. Not infrequently, however, the spread of borrowed values is quite illegitimate.

From the considerations adduced above it is clear that the direct values of any field of study in the secondary school are to be measured according to:

(*a*) The proportion of all individuals in whose lives situations will arise calling for the direct application of such knowledges, abilities, skills, etc., as are involved in that field of study. Are the values universal? If not, to what proportion of all individuals will they in all probability apply? Are they effective through the specialist or through all individuals?

(*b*) The number of occasions in the lives of individuals where the knowledges, etc., will apply. Are the values certain or contingent? Is the likelihood great or small that provocative situations will occur in the lives of many individuals?

(*c*) The character of the responses called for by situations in life. Are they such as to demand efficiency in production, accomplishment and thorough knowledge, or efficiency in consumption, utilization, and appreciation?

(*d*) The relation of the particular elements of approved value to the entire field of knowledge to which they belong. Are the various constituent elements which go to make up the body of any field of knowledge or any science (in the general sense) extensive enough or closely enough interrelated to justify the study of the general field as an organized and logically determined science? Are they isolated values or dependent values?

(*e*) The extent to which pre-secondary education or the informal education of life does not and cannot adequately provide training in the elements desired; e.g., how much direct value in mathematics is to be found for pupils in general after arithmetic has been successfully studied?

(*f*) The extent to which various elements of a given subject, not to any great degree directly applicable to situations in life, may be of value for training in subjects or elements of subjects which are of direct application in life; e.g., to what extent are the elements of algebra or geometry of value in the pursuit of other subjects which may have more direct bearing on life for the majority of individuals?

It is obvious that any exact analysis of these factors is quite impossible in the present state of our knowledge. In a general way, however, it is possible to apply these criteria at least to the extent that we may be able to avoid dogmatic statement where the fallacies mentioned may be and frequently are involved. In the chapters on the values of the various subjects of the program of studies in the secondary school these criteria will be applied as measures of the direct values of the different subjects.

II. INDIRECT VALUES

166. The transfer of improved efficiency. Throughout the history of secondary education certain subjects of study have occupied prominent positions in the secondary-school program on the basis of an assumption, implied or explicitly stated, that valuable general abilities may be developed through training in specific fields. Until relatively recent times such an assumption necessarily followed from the prevailing theory of "faculty psychology," which postulated that the mind was made up of a number of practically independent "faculties," such as the faculty of memory, the faculty of attention, the faculty of reasoning, and the like. It was held that these independent "faculties" trained through exercise on any given kind of material might then be employed in their improved efficiency on any other material, just as the muscles of the body trained by any given kind of exercise might be employed in their improved efficiency on any other form of exercise or labor. With the rise of modern psychology the theory of "faculty psychology" was relegated to the limbo of discarded absurdities and the necessity arose for a reëxamination of indirect or general values and the statement of such values in terms of modern psychological theory. Such a reëxamination involves the consideration of at least four related problems:

(1) Is it possible that efficiency improved through exercise on material (in studies) of one kind may be applied to material in a different field? Is there such a thing as the transfer or spread of improved efficiency? (2) If such transfer or spread of improved efficiency is possible, what is

the mode of its operation? (3) If it is possible, what is its probable extent? (4) If it is possible, are there any subjects of study which possess important transfer values?

167. Is transfer or spread a reality? In spite of the severe attacks which have been directed against theories of the transfer or spread of improved efficiency, apparently no one denies its existence and the first problem propounded may be answered at once in the affirmative. Thus, as representing two opposing schools of thought as far as other problems of transfer values are concerned, we may note the agreement of Thorndike and Judd. Thus Thorndike states:[1]

> No one can doubt that all of the ordinary forms of home or school training have some influence upon mental traits in addition to the specific changes which they make in the particular function the improvement of which is their direct object. On the other hand, no careful observer would assert that the influence upon the other mental traits is comparable in amount to that upon the direct object of training. — The real question is not, 'Does improvement of one function alter others?' but, 'To what extent, and how, does it?'

And Judd:[2]

> Special emphasis may furthermore be laid on the fact that there is no one who denies that some kind of transfer takes place. The real questions at issue are what is the degree of transfer and what is its method?

As stated in the two quotations the vital problems become: What of the manner in which transfer or spread of improved efficiency takes place? and, Is the extent of transfer or spread sufficient to warrant any emphasis on it in determining the relative values of subjects of study in the school? We may proceed at once, therefore, to the consideration of those two problems which are, of course, closely related.

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[1] Thorndike, E. L., *The Psychology of Learning*, p. 358. This and following quotations are made with the permission of the publishers, Teachers College Bureau of Publications.

[2] Judd, C. H., *The Psychology of High-School Subjects*, p. 404. Quoted with the permission of the publishers, Ginn and Company.

168. What is the mode of transfer or spread? Consideration of this problem may be introduced by quotations illustrating two "diametrically opposed" views. Thus Thorndike:[1]

> The answer which I shall try to defend is that a change in one function alters any other only in so far as the two functions have as factors identical elements. The change in the second function is in amount that due to the change in the elements common to it and the first. The change is simply the necessary result upon the second function of the alteration of those of its factors which were elements of the first function, and so were altered by its training. . . .
>
> Chief amongst such identical elements of practical importance in education are associations including ideas about aims and ideas of method and general principles, and associations involving elementary facts of experience such as length, color, number, which are repeated again and again in different combinations.
>
> By identical elements are meant mental processes which have the same cell action in the brain as their physical correlate.

Quite different is this from the theory of Judd that "transfer depends on the power of generalization" which emphasizes the fact that the power to generalize on the basis of specific experience is an original datum of the mind, always potential but depending for its emergence on training.

> When one studies the psychology of generalization he becomes aware of the uselessness of some of the formulas which have been proposed by those who hold that transfer of training takes place in cases where there are identical elements present. The identical element is usually contributed by the generalizing mind. On the other hand, there may be identical elements potentially present in various situations, but wholly unobserved by the untrained or lethargic mind. In fact, the discovery of the identical element in a situation is in some cases the whole problem of training.[2]

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[1] Thorndike, E. L., *op. cit.*, pp. 358–59. [2] Judd, C. H., *op. cit.*, p. 414.

> In the same fashion we may show that the principles of intellectual economy which Thorndike frequently includes in his statement of identical modes of procedure, namely, the principles that one can learn to avoid distractions of all sorts, or that he can refuse to give up a piece of work even when it is uncomfortable, represent generalized identities of procedure which are not always realized. In all these cases we must distinguish sharply between the possibility of identical modes of procedure and the actual achievement of this identity. Such an achievement depends upon the exercise of trained intelligence. The existence of possible modes of procedure does not invariably lead to their realization in fact.[1]

These views have been presented, not for the purpose of analysis or criticism, but as illustrative of different approaches to the problem of the method by which the transfer or spread of improved efficiency operates. The treatment of the problem in the following sections involves some of the elements found in the theory of Thorndike and some found in the theory of Judd. To the writer, at least, the two theories formulated by those psychologists are by no means irreconcilable in all respects.

169. Transfer or spread dependent on dissociation. No two situations in life calling for action on the part of any individual are ever exactly alike in all respects. Hence training for an absolutely fixed and specific reaction to any given situation is an impossible and valueless process. Strictly speaking there is no such thing as specific discipline. Fortunately for the economy of mental life and efficiency in behavior it is possible for the mind to select certain parts of any total situation and react to those parts with a minimum of attention to other parts of the total situation. Since such parts of total situations may be essentially the same it is possible to establish what in all important respects are specific situation-response connections, and hence it is possible to assign values to specific discipline. However, through this same characteristic of the human mind comes also the possibility of abstracting from a number of total specific situations, differing with respect to most of their constituent elements, any given element which may be common to all the total situations or a majority of them. Thus we get the law of dissociation expressed by Thorndike as follows:[1]

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[1] Judd, C. H., *op. cit.*, p. 416.

> Any element of mental life which is felt as a part of many total mental states, differing in all else save its presence, comes thereby to be felt as an idea by itself, and any movement which has been made as a part of many complex movements differing in all else save its presence comes thereby to be made as a movement by itself.

It is upon this process of dissociation that the abstraction of any general law, idea, principle, method, or the like must rest and the process of developing abstract or general ideas is a process of dissociation. Since the law itself is but an expression of a mode of mental life which is innate it merely expresses the "power of generalization" which is innate in the human mind and must be considered as an original datum without which the growth of mental life would be impossible.

The basis of the transfer or spread of improved efficiency is found in this law of dissociation or generalization. Just as a knowledge of sixness is acquired from experiencing its manifestation in six apples, six marbles, six men, etc., just as a knowledge of whiteness is acquired from experiencing its manifestation in white paper, white paint, white snow, white cats, etc., just as the meaning of number is acquired from experiencing its various manifestations in two objects, ten objects, etc., just as a concept of honesty is acquired from its manifestation in divers forms; just as a general principle of grammar, of mathematics, of science, of economics, is acquired by experiencing its manifestation in varying circumstances, — just so an idea of accuracy, an ideal of thoroughness, a concept of method, a habit of work, or the like, may be abstracted from its manifestation in varied fields and may be generalized on the basis of differing specific experiences. In all these cases the fundamental process is the same and the method of transfer or spread of improved efficiency is nothing more, nothing less, than the ordinary process of dissociation or generalization.

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[1] Thorndike, E. L., *Elements of Psychology*, p. 217 (2d edition, 1907).

Whether or not dissociation or generalization takes place depends on two factors — the mental attitude or "mind-set" which the individual brings to the situation, and the character of the situation experienced. Subjective elements are no less important than objective elements. It is perfectly possible for generalization to be potential in any set of situations without that generalization taking place because of the mind's attention to other elements than those involved in the dissociative element. On the other hand, it is perfectly possible for the mental attitude to project into objective situations a generalizing factor that is not highly fostered by the situation itself apart from subjective elements, though always there must be something in the objective situation to which the mind-set may be attached.

170. Factors which foster and facilitate dissociation. While dissociation and generalization are normal processes of the human mind and while they may be expected to operate with or without direction in the school, it is also true that certain factors may be arranged as to foster and facilitate the processes. The essential factors involved are four:

(1) A number of total situations must be experienced in which (*a*) the element to be dissociated and generalized is present in prominence, and (*b*) the other elements of the situation vary;

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[1] Cf. Thorndike, E. L., *Principles of Teaching*, p. 135.

(2) The element to be dissociated and generalized must be brought into the field of focal attention;

(3) The element to be dissociated and generalized must be of such a character that it may be held in the mind as a separate element. This is commonly facilitated when a distinguishing name or other symbol may be attached, or when a generalized definition or law is formulated;

(4) Practice must be given in applying the dissociated and generalized element in new situations.

Since dissociation is the basis of the transfer or spread of improved efficiency and since the extensive operation of dissociation is fostered by these factors, it is clear that any subject of study which does not permit the organization of materials in teaching so as to meet the conditions suggested cannot be expected to offer the most favorable opportunities for transfer. Further, it is clear that, as far as indirect values are concerned, subjects of study may to some extent be measured according to the degree in which those conditions can be met. Moreover, since the method by which material is presented is also involved in meeting those conditions, it follows that transfer cannot be expected to operate most effectively, unless both subject-matter and the method of teaching are adapted to the conditions favoring the process of dissociation and generalization. Hence the emphasis by Judd and Sleight on the importance of teaching method in connection with the problems of transfer.[1]

171. The above principles illustrated. The principles above outlined may be understood more clearly if applied to studies in the secondary school. Prominent among the conditions necessary to facilitate the transfer of any idea, principle, method, law, ideal, or the like, is that which demands that the element to be dissociated and generalized must remain essentially constant and that the other elements which are constituents of the total situations must vary. If, on the other hand, two or more elements remain constant, the resulting tendency is for those elements to be bound together more and more closely. Thus, let it be assumed that we wish to dissociate the element A from a number of total situations all of which contain that one element, but always in connection with other elements. Now, as long as the total situations have A as the only important constant element, conditions are favorable for the abstraction of A as a separate element. Thus in the total situations represented by the following combinations of elements,—

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[1] Judd., *op. cit.*, pp. 423–24, 432 *ff.*; Sleight, W. G., *Educational Values and Methods*, p. 171.

(1) A B C D E F
(2) A G H I J K
(3) A L M N O P
(4) A Q R S T U
(–) etc., etc.,

conditions are favorable for the dissociation of the element A, the only element common to all. If, on the other hand, two elements, A and B, are constant in the total situations experienced, the resulting tendency will be to dissociate those elements together, and further to establish a strong association between A and B, so that the two elements are grouped and neither A nor B is dissociated by itself. Thus in such total situations as may be represented by the combinations of elements,—

(1) A B C D E F
(2) A B G H I J
(3) A B K L M N
(4) A B O Q P R
(–) etc., etc.,

conditions are favorable for the dissociation of AB but not of A or B alone, and the conditions favor the constant association of the two elements which remain constant in the total situations experienced.

In the majority, if not all, of the subjects of study in the secondary school this is precisely the situation which arises to limit the transfer or spread of improved efficiency, partly as a result of the subject-matter employed, partly as a result of the methods of teaching. The fact will appear more clearly if we take a concrete illustration, e.g., from the field of geometry as commonly taught. Assume that it is desired through the study of geometry to develop a generalized method to be employed in the reflective thinking (reasoning) involved in problem solving — an element which is certainly involved in the processes of geometry and in every other field of mental activity. Call that element A. If we wish to facilitate the process of its dissociation it must be kept constant in the teaching of geometry. But also other elements in the total situations must be made to vary. It is here that difficulty arises, since it is extremely difficult to prevent certain other elements from remaining constant. Thus there is always present an element which makes it possible for us to recognize that we are dealing with geometry — certain concepts of space and number relations, and certain elements peculiar to the mathematics "class," classroom, or teacher. Some of those elements remain constant in spite of attempts to vary elements of specific content, exercises, problems, etc. Hence the normal situations in teaching geometry may be represented by such combinations of elements as

(1) A B C D E F
(2) A B C G H I
(3) A B C J K L
(4) A B C M N O
(–) etc., etc.,

and as a result conditions favor not the dissociation of the desired element A, but the constant association of ABC.

Thus in the great majority of cases the teaching of geometry in our secondary schools tends to favor, not the isolation and generalization of general methods of reflective thinking related to problem solving, but the close association of such methods to elements of geometrical content — a situation to some extent interfering with the process of transfer.

This does not, however, mean that such dissociation and subsequent transfer is impossible. Any such conclusion would imply that all the individual's experiences in reflective thinking and problem solving outside the geometry classroom are isolated from his experiences in that classroom, and would leave out of account or minimize the innate capacity of the mind to generalize on the basis of such other experiences — a capacity differing among individuals apparently according to original endowment. It would also leave out of account the possibility that the desired method, principle, or the like, may be isolated by the teacher or other individual and raised into consciousness in terms of a general law, rule, maxim, etc., expressed in terms which do not specifically associate content elements. Hence the bearing of Bagley's statement:[1]

> Unless the ideal has been developed consciously, there can be no certainty that the power will be increased, no matter how intrinsically well the subject may have been mastered.

Hence also the importance attached by Thorndike to connections "that carry vital maxims, notions of method, ideals of accuracy, persistence, verification, openmindedness and the like."[2] Likewise we find here the significance of the fact that in Squire's experiment the development of neatness in the case of arithmetic papers through training did not generalize neatness so as to function in geography and language

[1] Bagley, W. C., *The Educative Process*, p. 216.

[2] Thorndike, E. L., *The Psychology of Learning*, p. 421.

papers,[1] but, when the same experiment was repeated by Ruediger with emphasis on the conscious ideal of neatness as a general element, a general transfer of neatness was the result.[2]

172. An answer to problem 2. The transfer or spread of improved efficiency has its basis on the process of dissociation, which is a normal process depending on the innate capacity of the mind to generalize on the basis of limited, specific experiences. Such a process will take place to some extent with or without definite provision in the school. Its effective operation, however, may be fostered and facilitated by providing recognized favorable conditions. Whenever any element may be found which is a constituent of situations in different fields involving differing objective materials or content, the dissociation, generalization, and transfer of that element is always a potentiality. Whether or not it becomes an actuality depends in large degree on the establishment of some or all of the conditions favoring the process which have been described above. This involves both the character of the materials employed and the teaching methods used.

In passing, attention may be called to the fact that the mere existence of common objective elements in varying situations will not necessarily lead to dissociation and generalization. In fact it is by no means improbable that greater emphasis should be placed on subjective elements. Unless common objective elements are found in the varying situations dissociation and transfer are impossible. Also, however, unless some common subjective elements are found no dissociation and transfer can materialize. The possibility of transfer is found in the correlation of common objective elements and common subjective elements. This means that dissociation and transfer are not entirely automatic. The conception that transfer will always be actual where it is possible is a common error invalidating many studies in this field.

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[1] Bagley, W. C., *op. cit.*, p. 208.

[2] Ruediger, W. C., *The Principles of Education*, pp. 108–10.

173. **Problem 3: What is the extent of transfer?** In many ways the most important problem involved in the matter of the transfer or spread of improved efficiency concerns its probable extent. Is the transfer insignificant in amount so that for all practical purposes it may be ignored in questions of educational values, or is it sufficiently extensive to warrant careful consideration in attempting to evaluate subjects and methods of teaching? This is the question which must be considered in connection with problem 3.

Before attempting to discuss the extent of the transfer or spread of improved efficiency a word of warning is desirable. The main reason for troubling ourselves about problems of the transfer of improved efficiency is, of course, that, if it is a reality and if it is appreciable in amount, it provides for economy in education. Statements like the following are common: "General discipline teaches that we should learn to do A in order that we may be able to do B. Why not learn to do A in order to learn to do A, and learn to do B in order to do B? Why not learn to walk in order to walk, learn to run in order to run, and learn to swim in order to swim?"[1] Any such statement ignores the fundamental problem of transfer. The sole justification for any possible emphasis on "general discipline" would be that it *is* general, i.e., that through training in A one may be better equipped thereby, not only for B, but also for C, D, E, F, etc., — for a wide variety of activities. In this connection three facts should be kept in mind:

(1) The most enthusiastic proponent of transfer values could not claim that efficiency developed in the function

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[1] Cf. Moore, E. C., in *School and Society*, vol. VI, p. 482, end of column 2.

which has been the direct object of special training can be carried over unimpaired and without loss into functions which have not received direct training. The most that could be claimed is that an initial impetus may thereby be given to the related activities and the acquirement of efficiency in the related activities may be facilitated.

(2) The possible extent and importance of the transfer or spread of improved efficiency is to be measured by the sum total of its applications. If we represent the amounts of the transfer in various activities by $a_1, a_2, a_3, \ldots\ldots\ldots\, a_n$, and represent the number of occasions in each case by $t_1, t_2, t_3, \ldots\ldots\ldots\, t_n$, it is clear that the extent of the transfer value in any instance is to be measured by the formula

$$a_1t_1 + a_2t_2 + a_3t_3, \ldots\ldots\ldots\ldots + a_nt_n = x.$$

It is manifestly absurd to attempt to measure the extent and value of transfer by a comparison of the amount of improvement in the function which is the object of direct training and another single function which may be affected indirectly thereby. If there is any value to be attached to "general training" it is because it does apply to a relatively wide range of activities, not to any single activity. Hence the pertinence of Thorndike's statement:[1]

> Finally, it must be remembered that a very small spread of training may be of very great educational value if it extends over a wide enough field. If a hundred hours of training in being scientific about chemistry produced only one hundredth as much improvement in being scientific about all sorts of facts, it would yet be a very remunerative educational force.

Hence also the absurdity of the implications in Sleight's statements:[2]

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[1] Thorndike, E. L., *The Psychology of Learning*, pp. 421–22.

[2] Sleight, W. G., *Educational Values and Methods*, p. 73.

> In those few cases where improvement was brought about in one exercise through practice in another, as for example where practice in tables resulted in a development of power to memorize dates, the improvement is never equal to that made in the practice medium itself. In other words, the "indirect" is always less than the "direct" improvement. A computation showed that "direct" was worth, on the average, about 144 times "indirect" practice. Without attaching too much importance to the exact figures, there is ample evidence that the effects of "direct" outweigh immeasurably those of "indirect" training, and differentially that the schools have occasionally wasted most valuable time.

The inequality of "direct" and "indirect" training in any single case should be obvious. It should also be obvious that the importance of transfer is not to be measured in that way alone.

(3) It must be remembered that the capacity to generalize on the basis of limited specific experiences varies among individuals and that with any given amount of training given to members of a group the possibility and the extent of the transfer or spread of improved efficiency are varying quantities. It must further be recognized that the extent of transfer to be looked for is in part determined by the extent to which conditions are made favorable for the process of dissociation, again varying with respect to individuals.

The amount and extent of the transfer or spread of improved efficiency may be estimated in one or both of two ways: (*a*) through an examination of the results of experimental investigations; (*b*) through a study of the implications of general psychological theory. These are considered in the following sections.

174. **The results of experimental investigations.** The mere enumeration of the various experimental investigations designed to determine the mode and extent of the transfer or spread of improved efficiency would carry us far

beyond the limits of space here available. Likewise any detailed criticism of the methods employed or the conclusions drawn is here impossible.[1] All that may be attempted here is a general statement of facts which have apparently emerged from the several experiments made.

(1) The science of experimental psychology, in spite of its rapid and promising development within recent years, is still in its infancy. Hence the tools which experimental pedagogy must employ are as yet of the crudest.

(2) The experimental facts so far determined are relatively trivial when compared with the facts which must be determined before we can secure measurements of the transfer or spread of improved efficiency in the case of school studies or the occupations of life.

(3) The results of experimental investigations are confused and confusing, many being in direct conflict. Taken together, they resist organization into any clear-cut statement of the extent of the effect of special training on general ability. In addition faulty methods employed in many cases quite invalidate the results obtained and the conclusions drawn.

(4) By far the greater part of the experiments indicate that the transfer of improved efficiency is a reality. Nevertheless they also indicate that previous assumptions of a wholesale and automatic transfer are untenable.

These experiments also show, even by their indefinite and confused results, the complexity of the facilitating and interfering relations amongst man's hierarchies of habits. We see the possibility of a disciplinary effect where superficial observation would have expected none, the difficulty of transfer in a case where speculative and verbal thinking would have assumed that it was easy, and, in general, the ignorance that we suffer from concerning the internal constituents of almost every act of learning.[1]

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[1] For extended discussion of experiments made the reader is referred to references given at the close of this chapter, especially, Thorndike, Heck, Colvin, Judd, Ruediger, Henderson, Sleight, Rugg, Coover.

(5) In general experiments have suggested the possibility of interference as well as of transfer.

(6) To date experiments on memories have resulted in the most satisfactory evidence, indicating in general little transfer, except as improvement in methods of learning, etc., is involved.

(7) Experiments have suggested that, even where transfer or spread of improved efficiency is found, its emergence is not automatic but dependent to a considerable extent on the methods employed in training.

We may conclude that experimental evidence, while suggestive and indicative that older notions of general discipline are untenable, has as yet done relatively little to determine either the mode or extent of the transfer or spread of improved efficiency. We are therefore forced back on the field of general educational theory to a considerable extent. However unsatisfactory that may be, for the present we cannot do otherwise than consider its implications, with the hope and faith that improved methods of experimental psychology may soon afford more satisfactory evidence.

175. **Implications of psychological theory.** In discussing the method of the operation of the transfer or spread of improved efficiency it was suggested that it rests on the process of dissociation. In that connection it was pointed out that some transfer will take place wherever there is a real element to be transferred through generalization. It was also pointed out, however, that if conditions are made favorable the possibility of generalization and transfer is increased. It follows, therefore, that transfer in any case is not a constant and cannot be considered as operating auto-

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[1] Thorndike, E. L., *The Psychology of Learning*, p. 417.

matically. The resultant emphasis on methods of teaching and training is great. If these theories are sound it is clear that the extent of the transfer or spread of improved efficiency is conditioned by at least three factors: (*a*) the character of the materials (objective elements) involved; (*b*) the capacities of individuals to generalize and subjective elements brought to situations by individuals; and (*c*) the methods of training provided. All of these factors are variable and hence the extent of transfer or spread which depends on them must itself be a variable matter. In this connection it should be noted that, with respect to the psychology of learning, any attempt to dissociate materials from methods of experiencing them is erroneous and useless. From a pedagogical viewpoint the character of objective material is inextricably associated with the way in which it is experienced. Things, objects, ideals, etc., have no meaning for the individual other than as he experiences them. To say that generalization and transfer has no importance with respect to the values of educative materials but is important with respect to method ignores the fact that the character of materials in part determines methods of training and that methods of training in part determine the character of the materials as far as their effect on the individual is concerned. An antithesis of materials and methods is psychologically and pedagogically false.

176. Problem 4: the transfer values of studies. The problem of the transfer values claimed for various subjects of study in the secondary-school program is considered in connection with the several studies dealt with in following chapters. The general problem only will be considered in this section.

In time, it is to be hoped, experimental psychology will answer our present problem in undebatable terms. At present it cannot do so and again we are forced back on the implications of general psychological theory. Following the line of thought suggested in the preceding sections we may arrive at certain conclusions. The capacity for generalization is native in the human mind and is not confined or limited to any special objective material. Hence it may be assumed that any kind of material may serve as basis for generalization and for transfer values. On the other hand, it has been suggested that the manner in which such material is organized and presented to the mind is of the highest importance and in reality the manner of such presentation cannot be divorced entirely from the character of the materials with which it is concerned. It has further been suggested that the amount of generalization actually accomplished is dependent on the provision for meeting certain conditions which foster and facilitate dissociation or generalization. Subjects of study differ noticeably in the degree in which their materials may be or have been organized with respect to those conditions. Thus it is relatively easy to organize the materials of mathematics so as to facilitate the dissociation of methods of reflective thinking involved in problem solving — within the field of mathematics. In history, on the other hand, manipulation of its materials for such a purpose within its own field is relatively difficult. Thus there is a great difference between those two subjects affecting the conditions which primarily affect generalization and dissociation, even within their own respective fields. Whatever we may think about the possibility of transferring those methods to other fields, we must recognize that it cannot take place unless those original conditions are met. Thus also it must be recognized that the transfer of improved efficiency is not automatic and that if it is desired it must be deliberately sought through the organization of materials and teaching methods adapted to that end. Subjects whose primary aims in the secondary school look toward specific ends can provide but a limited amount of transfer values. Subjects of study whose primary purposes are the development of generalized traits can produce but limited specific values. Subjects of study which aim at both ends at once are likely to produce limited results in both. With various subjects of study different ends may, possibly, be desirable. In passing it may be well to say that as at present organized and taught few studies are well adapted to any of those ends.

III. General Analysis of the Program of Studies

177. The evolution of the program in America. The history of the development of the program of studies in the American public secondary school is illuminating in many ways and affords clear evidence of the shifting values assigned in contemporary theory and practice at different periods. Thus an examination of the data provided in Table CXVIII shows that three main periods may be rather definitely described in terms of the prominence attached to different classes of subject matter. During the seventeenth and eighteenth centuries dominant values in public secondary education in this country were attached to the humanistic studies. During the nineteenth century such humanistic studies gave way in part to natural sciences, although retaining much of their former prestige. Toward the close of the nineteenth century directly vocational studies began to become important and give signs of becoming increasingly important at the present time.

A study of the history of the program of studies of the secondary school shows clearly that the values attached to different subjects of study have varied at different times. Thus the study of logic was deemed sufficiently valuable to be included in the State requirements in Massachusetts from

Table CXVIII. Subjects of Study introduced at Different Times into the Program of Studies of the Public Secondary School of America *

English: Reading (1821?), Writing (1821 or 1635), Spelling (1821 or 1635), Grammar (1821 or 1635), Composition (1821 or 1635), Rhetoric (1823 or 1635), Declamation (1821?), Literature (1821), Forensics (1821), Etymology (1839), History of English Literature (1841).

Foreign Language: Latin (1635), Greek (1635), French (1826), German (1838), Spanish (1830), Italian (1843), Anglo-Saxon (1850).

Mathematics: Arithmetic (1814–1821), Algebra (1814–1821), Geometry (1814–1821), Trigonometry (1814–1821), Surveying (1821), Navigation (1821), Mensuration (1821), Analytical Geometry (1839), Differential Calculus (1841).

Sciences: Physics or Natural Philosophy (1821), Chemistry (1826), Astronomy (1821), Physiology (1839), Botany (1826), Geology (1837?), Zoölogy (1842), Hygiene (1839), Mineralogy (1837?), Natural History (1833), Meteorology (1852), Mechanics (1839), Physical Geography (1852?), Anatomy (1837), Technology (1851), Engineering (1852), Medicine and Surgery (1852?), Household Science (1858), General Science ("Elements of Arts and Sciences," 1823), Agricultural Chemistry (1845).

Social Sciences: History of the United States (1821), General History (1823), History of Civilization (1849), Ancient History (1821 or 1635), Mediæval History (1842), Modern History (1821), History of England (1814–1828), History of France (1827?), History of a single Federal State (1839), Constitution of the United States (1828), Constitution of a single Federal State (1840), City Government (1842), "Community Civics" (1849), Political Philosophy (1821), Political Economy (1821), Ancient Geography (1821 or 1635), Sacred Geography (1823), Modern Geography (1821), Ethics (1839), Moral Philosophy (1821), Natural Theology (1823), Evidences of Christianity (1823).

Other Subjects: Logic (1821), Intellectual Philosophy (1829), Bookkeeping (1823), Commerce (1838), Sewing (1840), Stenography (1849), Manual Training (1880), and all the various vocational and industrial subjects introduced within the past two or three decades; Drawing (1826), Music (1837).

* Table compiled from numerous sources. The first appearance of many subjects in the public secondary school is difficult to determine. The above dates are, however, fairly sure.

1827 to 1898. It is seldom if ever found in a secondary-school program at present. Thus botany, astronomy, geology, intellectual science (psychology), moral science (ethics) were required in certain high schools in that State from 1857 to 1898. Of these some have survived and others disappeared. Of all the various subjects mentioned in the above list of subjects in the program of studies in the public secondary school and others which should be added to make the list complete twenty-one enrolled as large a proportion as five per cent of the total public high-school population in 1915.

178. The relative prominence of various subjects. While it is not easy to determine the relative values attached to the various subjects of study in the secondary-school pro-

TABLE CXIX. PERCENTAGES OF PUPILS IN PUBLIC HIGH SCHOOLS PURSUING CERTAIN STUDIES *

Subjects of study	*1889–1890*	*1894–1895*	*1899–1900*	*1904–1905*	*1909–1910*	*1914–1915*	*Total number 1914–15*
Latin	34.69	43.97	50.61	50.21	49.05	37.32	434,925
Greek	3.05	3.10	2.85	1.47	.75	.29	3,351
French	5.84	6.52	7.78	9.14	9.90	8.80	102,516
German	10.51	11.40	14.33	20.25	23.69	24.39	284,294
Spanish	...	...	...	...	.67	2.39	31,743
Algebra	45.40	54.27	56.29	57.51	56.85	48.84	569,215
Geometry	21.33	25.34	27.39	28.16	30.87	26.55	309,383
Trigonometry	...	2.53	1.91	1.71	1.87	1.48	17,220
Astronomy	...	4.79	2.78	1.22	.53	.28	3,224
Physics	22.21	22.77	19.04	15.66	14.61	14.23	165,854
Chemistry	10.10	9.15	7.72	6.76	6.89	7.38	86,031
Physical geography	...	23.89	23.37	21.52	19.34	14.58	169,911
Zoölogy	...	...	...	...	8.02	3.21	37,456
Botany	...	...	...	...	16.83	9.14	106,520
General biology	...	...	...	...	...	6.90	80,403
Geology	...	5.00	3.61	2.34	1.16	.48	5,558
Physiology	...	29.95	27.42	21.96	15.32	9.48	110,541
Psychology	...	2.74	2.38	1.31	.96	1.17	13,626
Rhetoric	...	32.05	38.48	48.54	57.10	58.42	680,871
English literature	...	...	42.10	49.34	57.09	55.82	650,613
History	27.31	34.33	38.16	40.88	55.03	50.54	589,067
Civil government	...	...	21.66	17.97	15.55	8.64	100,736
Civics	...	...	...	...	...	7.08	82,588
Agriculture	...	...	...	...	4.66	7.17	83,573
Domestic economy	...	...	...	...	3.78	12.89	150,276
Industrial	...	...	...	...	...	.81	9,424
Manual training	...	...	...	...	...	11.17	130,155
Drawing	...	...	...	...	...	22.87	266,492
Vocal music	...	...	...	...	...	31.50	367,188
Bookkeeping	...	...	...	...	...	3.42	39,816

No such figures are accessible for other subjects in the program of studies in the secondary school.

* *Report of the United States Commissioner of Education* (1916), vol. II, p. 487.

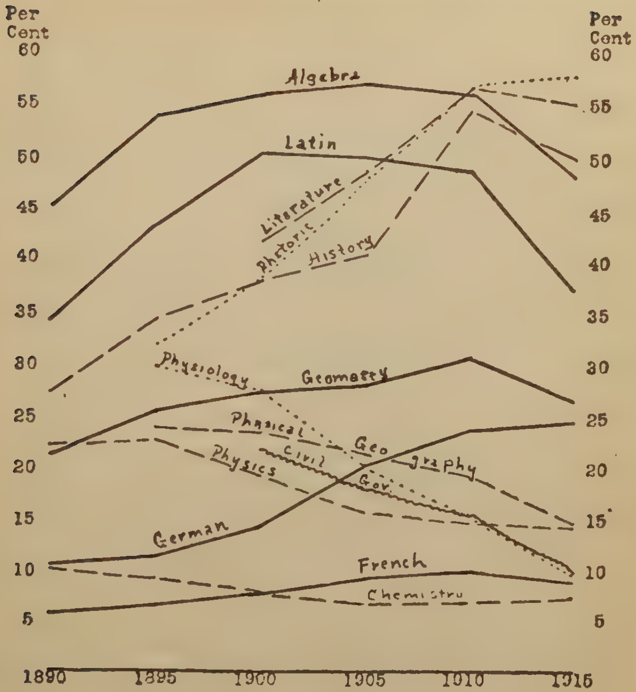

Figure V. Illustrating Table CXIX

gram at present, valuable information (as far as it goes) may be gained from the data presented in Table CXIX and in Figure V. Unfortunately the reports of the Federal Commissioner of Education supply data for certain subjects of study only, and fail to supply desirable data for other subjects, especially subjects of a technical, vocational, and industrial character. It is also unfortunate that the data available do not afford information in terms of the numbers and proportions of all pupils who somewhere in their high-school courses study the various subjects.

In interpreting these statistics certain facts should be noted:

(1) The practice, common to the majority of secondary schools, of requiring all pupils, or certain groups of pupils, to study certain subjects, e.g., English, algebra, tends to raise the proportions of pupils studying those subjects, and the figures, therefore, cannot be taken as measuring the appeal of the subjects to pupils.

(2) In some cases the unit of study does not stand out clearly as a separate subject and hence figures reported frequently represent a number of pupils in excess of those taking a separate and distinct course in the subject. Thus possibly with rhetoric or civics.

(3) In some cases the sequential character of the work in a subject, tending to involve two, three, or four years for the completion of the subject, gives an appearance of greater support than would otherwise be indicated. Thus history is grouped under one title. Latin, engaging about one third of the pupils in the secondary schools in 1915, may not have affected more individuals than German, a subject which was pursued in 1915 by approximately one quarter of all secondary-school pupils — Latin at that time commonly comprising a four-year course and German commonly comprising a two- or three-year course.

(4) Within the past two decades the proportion of pupils studying any single natural science has apparently decreased. Whether or not this means that the total number of pupils studying natural science in some of its phases has decreased the figures afford us no means of deciding. In this connection it should be noted that no figures are presented in the table above for general science, applied science in agriculture, etc.

(5) Attempts to determine the proportions of pupils engaged in the study of "foreign languages," "natural

science," etc., by adding together the different percentages of the separate languages, sciences, etc., involve a serious error and represent no real situation, since a large number of pupils is engaged in studying two or more languages, two or more sciences at the same time.

179. **The necessity of selection.** It is obvious that all the subjects now found in the program of studies of the secondary school cannot and should not be studied by all pupils. Selection is therefore a necessity and, since it is a necessity, it follows that some means must be devised to determine the relative values of the various subjects of study as a basis for such selection. It was pointed out in the first part of this chapter that the various subjects of study are to be evaluated in terms of the degree in which those subjects contribute to the aims and functions of secondary education. It was also pointed out that that contribution might be direct or indirect. One may readily recognize that certain social studies may contribute directly to the social-civic aim of secondary education in such a way that the values of those subjects will be universal and direct. One may readily recognize that other subjects may contribute directly to the vocational-economic aim of secondary education in such a way that the values of those subjects will be direct and limited or contingent. However, after such analysis of direct values has been accomplished there still remain in the program of studies as at present organized certain subjects whose values, if they possess important values, cannot be stated in terms of direct contribution to the aims of secondary education and other subjects whose position and popularity in the secondary-school program cannot be justified by reliance on direct but limited or contingent values. Thus it cannot be maintained seriously that one half of the pupils in the secondary school in 1910 were justified in studying Latin on the basis of its *direct* values. Neither can one jus-

tify on the grounds of *direct* values alone the study of German by nearly one quarter of the boys and girls in the public secondary schools. Further, the study of algebra, undoubted though its limited or contingent direct values are, cannot be justified for nearly all pupils in the first year of the public secondary school on the ground of *direct* values. The same is the case with geometry.

For some of the subjects now found in the secondary-school program of studies justification must rest, if justification be found, largely on the indirect values which may be attached to them. In the cases of several other subjects of study the large proportion of pupils engaged in those subjects cannot be justified on the basis of direct values alone. To the first group belongs Latin. To the second group belong algebra, geometry, and German. The final value of subjects of study in the program of the secondary school is, therefore, to be determined by an analysis of the degree in which the subject may contribute directly or indirectly to the aims and functions previously outlined. Such an analysis is attempted for the various subjects in the following chapters of this book.

PROBLEMS FOR FURTHER CONSIDERATION

1. Consider any community of approximately 50,000 inhabitants. Estimate roughly the proportions of the population who may reasonably be expected to have direct use for the various subjects of study in the secondary-school program; e.g., what proportion of the inhabitants wil commonly find opportunity to use algebra or chemistry directly?
2. Make a critical study of experiments which have been made to solve the problem of transfer of improvement. Interpret the conclusions with respect to the problem of indirect values in the secondary school. (Cf. Rugg, Heck, Ruediger, Thorndike, Coover, in list of references.)
3. Find specific examples of arguments for direct values of subjects of study which involve one or more of the fallacies mentioned in section 165.
4. Choose any subject of study in the program of studies of the secondary school. Analyze the values commonly claimed for that subject.

5. Find specific examples of arguments for or against indirect values of subjects of study which involve one or more of the fallacies mentioned in section 173.
6. Classify subjects of study in the program of the secondary school according to the readiness with which the materials may be or are manipulated for the purpose of facilitating the process of dissociation of any important element.
7. To what degree is it true that "the acceptance of the fundamental doctrine of modern psychology, that there are no faculties in the mind, of itself necessitated the abandonment of the doctrine of formal training in education." (Moore, E. C., *What is Education?* p. 99.)
8. How is the problem of transfer related to the relative values of "pure" and "applied" science? (Cf. Colvin, S. S., *The Learning Process*, pp. 247 *ff*.)
9. How is the problem of transfer related to the application of principles, methods, etc., within any given field of study?
10. Give examples of different subjects of study masquerading under the same name in the program of study of the secondary school.

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CHAPTER XII

THE PLACE OF ENGLISH IN THE PROGRAM OF STUDIES

I. General Considerations

180. The historic dominance of linguistic and literary studies. Linguistic and literary studies have tended to dominate educational institutions from their very beginning. For the Greeks only, and at certain periods only for them, would this general statement need to be qualified. In the later period of Greek education began the emphasis on linguistic and literary studies which they contributed to Roman education and which Roman education contributed to Europe and America. Throughout the medieval period, the Renaissance, and the Reformation education in the schools of Europe was almost exclusively linguistic and literary, and almost exclusively confined to the study of Latin and Greek. This emphasis on the Latin and Greek languages and literatures was not surprising, since practically all existing knowledge was preserved in those tongues, since Latin was the common medium of communication among the learned, and since literatures in the vernaculars began only as late as the early Renaissance. Even after the rise of literatures in the vernaculars, however, secondary education was restricted to the study of the classical languages and literatures with attention here and there only to the mother tongues and their literatures — a state of affairs which persisted until long after the beginning of secondary education in America.

It has already been shown that during the seventeenth and eighteenth centuries secondary education in America was limited to the study of the Latin and Greek. However, the practice, common in Europe, of making instruction and all language use in the secondary school depend on the actual use of Latin, to the exclusion of the mother tongue, was never successful and in reality was seldom attempted in the American secondary school of the colonial period. Translation was regularly employed and the classical languages were constantly brought into relation with the mother tongue. Thus, while it is true that English literature received little if any attention in the Latin grammar school of America, it is a fact that the English language was indirectly a very real study in the colonial secondary school.

With the beginning of the realistic movement in education (marked by the beginning of the *Realschule* in Germany and by the academy movement in England, Scotland, and America) came the direct study of the native language and native literature in the secondary school. Through the academy the study of the English language and literature was contributed to the public high school in the third decade of the nineteenth century. From that time the study of English has constantly increased in the American secondary school until at the present time it occupies by far the most prominent position in the program. Its development since 1890 may be estimated in part from the figures presented in Table CXIX and from Figure V.

181. **The present status of English in the program.** At the present time English is probably the only study universally required of all pupils in the secondary school at some stage or stages within the course. Probably one sixth of the total time of the high-school course is devoted by most pupils to the study of the mother tongue and its literature. In this connection we may note current practice in Germany and in France. In the last four grades of the Prussian *Gymnasium* or *Realgymnasium* 8.6 per cent of the total

time is specifically devoted to the study of German. In the *Oberrealschule* the proportion of time is 10.5 per cent. German is required of every pupil in every grade of the higher school in Germany. In France a larger proportionate amount of time is devoted to the study of French, the per cent of the total time ranging from 16.4 for Sections A and B to 19.1 for Section D during grades IV–I. Thus it would appear that for corresponding grades a larger proportion of time is devoted to the study of English in the American secondary school than is devoted to the study of German in the Prussian higher school, and, possibly, a somewhat smaller amount of time than is devoted to the study of French in the French higher school. It should be remembered, however, that both in Germany and France some foreign language is prescribed for all pupils in the higher schools — a factor of no small importance.

182. English and the aims of secondary education. The readiness with which values may be attached to the study of English as contributing to the ultimate aims of secondary education tends to permit teachers of English and others to neglect the necessity of analyzing the various factors involved. In English, as much as in the case of any other subject, it is necessary to analyze aims, values, materials, and methods. This is recognized by the Committee on the High-School Course in English when it states: [1]

> These fundamental aims should be implicit in the teacher's attitude and in the spirit of the class work: (*a*) Cultural. To open to the student new and higher forms of pleasure. (*b*) Vocational. To fit the student for the highest success in his chosen calling. (*c*) Social and ethical. To present to the student noble ideals, aid in the formation of his character, and make him more efficient and

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[1] National Education Association, *Report of the Committee on the High-School Course in English*, pp. 7, 5. Cf. *Reorganization of English in Secondary Schools*, Report by the National Joint Committee on English, Bureau of Education Bulletin (1917), no. 2, pp. 30-32.

actively interested in his relations with and service to others in the community and in the nation.

The Committee believes that a single statement of aims will prove serviceable as a guide to the English work of all schools. Stated broadly, it should be the purpose of every English teacher, first, to quicken the spirit and kindle the mind and imagination of his pupils and to develop habits of weighing and judging human conduct, with the hope of leading them to higher living; second, to supply the pupils with an effective tool for use in their future private and public life, i.e., the best command of language which, under the circumstance, can be given them.

The particular results to be sought may be somewhat specifically indicated as follows:

In general, the immediate aim of secondary English is twofold:

(*a*) To give the students command of the art of expression in speech and writing.

(*b*) To teach them to read thoroughly and with appreciation, to form in them a taste for good reading, and to teach them how to find books that are worth while.

These two aims are fundamental; they must be kept in mind in planning the whole course and applied in the teaching of every term.

These recommendations are here presented in some detail for the special purpose of suggesting that the analysis of aims in teaching English as stated by so important and representative a body as a national committee is far from adequate. The immediate aims of the teaching of English as thus stated are far too narrow and leave out of account values and purposes if anything more fundamental than those suggested or implied. Thus in aim (*a*) emphasis is placed on "the art of expression" as the primary aim in teaching language. Language is far more important as an instrument by the use of which the individual's higher mental processes themselves are aided — as an instrument conditioning his very thinking — than as an instrument by which he may communicate his thought. Language is a tool conditioning thinking as well as a tool for communicating thought and its use for thinking is prior to its use for expression. Thus also in aim (*b*) as stated (except as may be involved in the ambiguous phrase "thoroughly and with appreciation") factors other than those contributing to culture and literary appreciation are almost if not quite lacking in emphasis. The point of these criticisms will appear more clearly in the following sections of this chapter.

183. **The aims of language and of literature distinguished.** It is in many ways unfortunate that the study of language and the study of literature have been grouped under the one head "English" in the program of the secondary school. However much the two fields of study may be correlated in teaching, however much they may depend upon and contribute to each other, the values, aims, and methods of the two studies are as widely separate as of any two studies in the program. The values and aims of language study in the secondary school center around the development of ability to use language as a tool and methods of teaching should be determined thereby. Commonly this is stated to mean the development of an ability to express one's own thought and to understand the thought of others as expressed in oral or written speech. Any such statement emphasizes the function of language as a medium for communication and fails to recognize the fundamental fact that language is not merely a medium for the communication of thought, *but a condition and tool for the thinking process itself.* On the other hand, the values and aims of the study of literature center around the æsthetic elements of form, the moral-social elements of content, and the avocational elements of reading habits. True it is that the study of language is closely related to the study of literature, but it is also true that it is closely related to practically every other subject of study in the program.

Failure to recognize the distinct and separate values and aims of language study and the study of literature constitutes one of the most serious difficulties in the teaching of English in the secondary school. On the one hand it results in a tendency to minimize the study of language or to deal with it incidentally in connection with the study of literature. On the other hand it results sometimes in making a piece of literature merely a basis of linguistic study, thus interfering with the attainment of the separate aims of the study of literature.

II. The Aims and Values of the Study of Language

184. The relation of language to thought. From whatever point of approach we consider the problem of language values and language aims, we face at once the problem of the relation of language to thought. The relation of language to the communication of thought is readily recognized. Therein is found the origin of articulate language. However, with the development of language use it became an instrument not only for the communication of thought but also for thinking itself. Created primarily for the purpose of acquainting others with the mental states of the individual language has become the means by which the individual's own mental life is fundamentally conditioned. In its broadest sense "language" connotes more than verbal symbols alone and must be conceived as including every sign consciously employed to convey meaning. Notwithstanding this extended meaning of the term language, however, it is true that the dominant factor in language for adults is verbal imagery of some sort. Thus Dewey says: [1]

> *The chief intellectual classifications that constitute the working capital of thought have been built up for us by our mother tongue.*

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[1] Dewey, J., *How We Think*, p. 175. The best general statement of the relation of language to thought is found in that book, especially in chap. XIII. The extracts quoted are copyrighted by the publishers, D. C. Heath and Company, and are quoted with their permission.

So important is this conception of the relation of language to the process of thinking and so important is the bearing of that relation on the study of the mother tongue we may follow Dewey in further analysis and attempt to discover what functions language performs in assisting thought and its communication.

(1) In relation to individual meanings verbal symbols perform three important functions:

(*a*) They select and detach meanings from what are otherwise confused and confusing blurs. The appropriate naming of anything is closely related to the identification of that thing — so closely that there is a necessary parallelism between the development of vocabulary and the development of clearly defined percepts, concepts, feelings of meaning, and the like. The development of individual meanings cannot proceed very far without the development of the corresponding vocabulary.

(*b*) Verbal symbols register and preserve meanings which would otherwise be limited to situations of direct contact:

> Since intellectual life depends on the possession of a store of meanings, the importance of language as a tool of preserving meanings cannot be overstated. To be sure, the method of storage is not wholly aseptic; words often corrupt and modify the meanings they are supposed to keep intact, but liability to infection is a price paid by every living thing for the privilege of living.[1]

(*c*) They apply meanings to new experiences:

> When a meaning is detached and fixed by a sign, it is possible to use that meaning in a new context and situation. This transfer and reapplication is the key to all judgment and inference [without which] no cumulative growth of intelligence would occur; experience might form habits of physical adaptation but it would not teach anything, for we should not be able to use a prior experience consciously to anticipate and regulate further experience. To be

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[1] Dewey, J., *op. cit.*, p. 174.

> able to use the past to judge and infer the new and unknown implies that, although the past thing has gone, its *meaning* abides in such a way as to be applicable in determining the character of the new. Speech forms are our great carriers: the easy-running vehicles by which meanings are transported from experiences that no longer concern us to those that are as yet dark and dubious.[1]

(2) In relation to the organization of meanings verbal symbols perform equally important functions:

> Signs not only mark off specific or individual meanings, but they are also instruments of grouping meanings in relation to one another. Words are not only names or titles of single meanings; they also form *sentences* in which meanings are organized in relation to one another. . . . Propositions, sentences, bear the same relation to judgments that distinct words, built up by analyzing propositions in their various types, bear to meanings or conceptions; and just as words imply a sentence, so a sentence implies a larger whole of consecutive discourse into which it fits.[2]

Meager though this statement of the functions of language is, it is sufficient to emphasize the view, frequently minimized, or totally ignored, that language is an instrument even more important for the individual's thinking than for the expression of his thought or for his understanding of the thoughts of others expressed through language. The point cannot be too strongly enforced that language is an instrument on which must depend the individual's actual thinking process to a very considerable extent. Any method of teaching English which minimizes that fact is fundamentally at fault, and any course of study in English which subordinates the relationing of language to thought is open to severe criticism.

185. **The aims and values of the study of language.** The values of the study of one's mother tongue are twofold, being found in the use of language (1) as an instrument by which the individual's thinking is facilitated and condi-

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[1] Dewey, J., *op cit.*, pp. 174–75.

[2] *Ibid.*, p. 175.

tioned, and (2) as a medium of communication between individuals. Failure to recognize properly the first of these values and the tendency to devote attention almost exclusively to the second constitutes one of the most serious defects in the teaching of the mother tongue in the secondary school. "Teaching pupils to express themselves in speech and writing" is psychologically dependent on and pedagogically subordinate to the process of making language an effective instrument for the individual's own intellectual enterprises.

The early stages of language development are affected extensively by the necessity of providing an instrument suitable for the ordinary affairs of everyday life and especially involve "practical" and social uses. Gradually, however, must become more and more prominent the need of language as an intellectual instrument. Hence Dewey's statements:[1]

> This distinction of the practical and social from the intellectual use of language throws much light on the problem of the school in respect to speech. That problem is *to direct pupils' oral and written speech, used primarily for practical and social ends, so that gradually it shall become a conscious tool of conveying knowledge and assisting thought.* How without checking the spontaneous natural motives — motives to which language owes its vitality, force, vividness, and variety — are we to modify speech habits so as to render them accurate and flexible *intellectual* instruments? It is comparatively easy to encourage the original spontaneous flow and not to make language over into a servant of reflective thought; it is comparatively easy to check and almost destroy (so far as the schoolroom is concerned) native aim and interest, and to set up artificial and formal modes of expression in some isolated and technical matters. The difficulty lies in making over habits that have to do with "ordinary affairs and conveniences" into habits concerned with "precise notions."

Proper recognition of the importance of language use as related to the individual's own mental development should indicate the fallacy of those who state that the language tool should or can be acquired by the end of the elementary-school period. The mechanics of language use, i.e., the ability to recognize groups of letters as familiar and to utter certain sounds when those symbols are seen in reading, the ability to put together certain letter symbols in response to specified auditory stimuli in spelling, the ability to make certain motor responses in writing, etc., — all those abilities may, perhaps, be well acquired by the close of the elementary-school period. However, the far more fundamental abilities of relating verbal symbols and word uses to thought can never be acquired in anything like adequate form within that period. These abilities should, of course, begin at the earliest stages. They continue to be fundamental, or even increase in importance, as education proceeds. They are of predominant importance in the secondary school.

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[1] Dewey, J., *op. cit.*, pp. 179–80.

186. Language as an intellectual instrument. Involved in the development of language both as an instrument of thought and for the transmission of thought are three elements or processes: (1) the development of the capital stock of words — the extensive development of vocabulary; this is inextricably related to (2) the development of increased precision and accuracy in the use of words as related to thought — the intensive development of vocabulary; this again is inextricably related to (3) the development of habits of interrelating those words so as to facilitate consecutive thinking and consecutive discourse. Each of these elements deserves attention as involved in the study of language in the secondary school.

(1) The extensive development of vocabulary: The proper development of vocabulary comes with extended experience with things and persons and the acquiring of words correctly related thereto, or by experiencing the use of words in contexts.

> To grasp by either method a word in its meaning is to exercise intelligence, to perform an act of intelligent selection or analysis, and it is also to widen the fund of meanings or concepts readily available for further intellectual enterprises.[1]

The greater the number of words really associated with their appropriate percepts, concepts, feelings of meaning, and the like, which are available, the greater is the possibility of organizing and expressing thought: the more limited the stock of words available, the more limited must be the possibility of thought and its expression.

This is far from meaning, however, that extensive vocabulary alone is sufficient to guarantee any great amount of ability to think or to express thought. Extensive thinking without extensive vocabulary is impossible. Extensive vocabulary without extensive thinking is quite possible and very common. This arises on the one hand from the fact that verbal symbolic imagery tends constantly to outstrip the concrete imagery without ultimate reference to which the verbal symbol must always remain vague, general, and ill-defined. It arises on the other hand from the fact that the "passive vocabulary" tends constantly to outstrip the "active vocabulary." By "passive vocabulary" is meant here that portion of one's vocabulary which consists of words recognized as more or less familiar and carrying some meaning of a vague and general character when experienced in a context or situation where other elements lend at least some temporary clue to the meaning, but which carry little or no meaning in isolation and cannot be employed by the individual in handling or expressing his own thought. It is a task of education to prevent this "passive vocabulary" from remaining passive and to make it a real instrument of thought and expression. On the other hand, there is every evidence that, as commonly conducted, education in the school tends to foster the development of a "passive vocabulary" or even to develop an "expression vocabulary" which is far from being closely related to the thought elements for which it should stand. By the close of the elementary-school period, if not long before, there is manifest a tendency for pupils to associate words with words rather than with the concrete realities for which they stand or the elements of thought to which they should be related. There can be no doubt that it is one of the foremost aims of teaching in the school to prevent this mechanizing of language and to establish proper language-thought relations. This means the extension (or correction) of vocabulary with real relation to the mental state supposedly represented. Any other extension of vocabulary is actually harmful rather than helpful.

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[1] Dewey, J., *op. cit.*, p. 180.

(2) *The intensive development of vocabulary:* Discovering and naming differing experiences is the basis of vocabulary development. Precision and accuracy in thinking and in the expression of thought is vitally conditioned by precision and accuracy in word uses. Increase in the precise and accurate use of words is no less important than the increase in the number of words more or less at one's command. In fact it is largely through increased differentiation in discovering and naming meanings that the extensive development of vocabulary becomes possible.

The pupil enters the secondary school with a fairly extensive vocabulary already acquired — acquired in the sense that he has already come into contact with a large number of words so that he may recognize them in a context or even employ them in certain word-word associations. His symbolic imagery has far outstripped his concrete imagery and his "passive vocabulary" is out of all proportion to his "active vocabulary." On the whole, his vocabulary is characterized by generality, vagueness, indefiniteness, or even error. However extensive his vocabulary may be, unless it is characterized by precision and accuracy and definiteness in use for thinking and expression, it must fail to be an efficient instrument for those processes, and must lead to looseness and error in thinking.

> Vagueness disguises the unconscious mixing together of different meanings and facilitates the substitution of one meaning for another, and covers up the failure to have any precise meaning at all. It is the aboriginal logical sin — the source from which flow most bad intellectual consequences.[1]
>
> The first meanings of terms, since they are due to superficial acquaintance with things, are general in the sense of being vague. . . . Such vagueness tends to persist and to become a barrier to the advance of thinking. Terms that are miscellaneous in scope are clumsy tools at best; in addition they are frequently treacherous, for their ambiguous reference causes us to confuse things that should be distinguished.[2]

It has long been recognized that our feelings aroused through the senses (percepts, etc., when identified or interpreted in connection with previous experiences) are at first vague, general, ill-defined, and that with a series of subsequent experiences only do they become clear, specific, definite, well-defined, clear-cut and precise percepts, etc., which have gradually emerged into clearness out of their original hazy and foggy condition. So terms (the symbolic images standing for those percepts, etc.) only gradually emerge into clearness and definiteness out of their original vagueness and generality. The two processes — development of percepts, etc., and development of related vocabulary — are so closely related that neither process can proceed far without the other. The two proceed by climbing on each other's shoulders. As the relation between percepts and vocabulary develops, so develops the relation between concepts or general notions and their corresponding symbolic images — general words or names — and so develops the relation between feelings of abstraction, feelings of relationship, etc., and their corresponding terms. Finally, without such development the complex processes of selective thinking are impossible.

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[1] Dewey, J., *op. cit.*, p. 130.

[2] *Ibid.*, p. 182.

(3) *The development of habits of consecutive thinking and consecutive discourse:* Aside from what we may call the "intrinsic" meaning of a word — the relatively constant element of the fundamental root idea (that which makes it possible for us to recognize a term in different contexts) — there is always in actual use what we may call an "extrinsic" meaning — the varying element attached to the constant element or root idea as a modification of it when used contextually in relation to other terms (that which makes it possible for us to use the same word with somewhat different shades of meaning determined by its surroundings). As a matter of fact, seldom, if ever, does the same term (the auditory, visual, motor, or other image) carry the same meaning in any two different contexts, and therefore the readiness with which varying meanings may be attached to the same term is the real desideratum both for thinking and for the expression of thought. The development of a rather extensive vocabulary in which the intrinsic meanings of terms are fairly adequate is a relatively simple task and one which may possibly be accomplished through elementary education. The development of an extensive vocabulary in which the extrinsic meanings of terms are adequately mastered is an extremely difficult task of great importance in secondary education. This can be accomplished only by constant practice in the organization of consecutive thinking and consecutive discourse.

187. The dominant purposes of language studies. If the assumptions outlined at some length in the preceding sections are sound, it follows that the language studies of the

secondary school should find their fundamental values and primary aims in the development of ability to employ language as an instrument of thinking and thereby as an instrument for the expression of thought. Such, therefore, should be the primary aim of the teaching of composition, and all elements which may be involved in the teaching of that subject should be considered of minor importance. Such also should be the aim in teaching those portions of grammar and rhetoric which may be justified in secondary education. With these criteria in mind there should be little danger that an all-embracing study of formal grammar would usurp the place of functional or applied grammar, or that an elaborately formal rhetoric would carry the study of that subject far beyond the legitimate limits of its applications in the secondary school.

The study of language in the secondary school should in all cases be dominated by the conception that only exercise in the use of language can achieve the desired aims. Some knowledges about language are legitimate aids and many lend a stimulating interest to its study. No excuse can be found, however, for the practice at present common of emphasizing information about language and minimizing training in the use of language.

188. Limitations of the study of the mother tongue. Unquestioned though the importance of the study of language is, it must be recognized that in the development of the ability to use one's mother tongue as a tool for thinking and for communicating thought the study of English suffers certain important limitations, most of which center around the difficulty of making over habits that have to do with "ordinary affairs and conveniences" into habits which are concerned with "precise notions." Here several considerations may be adduced.

(1) In the development of speech use there comes a time

when the use of one's mother tongue for expression and interpretation (especially in reading) becomes so mechanical that the very facility with which one employs the language constitutes the greatest barrier to interfere with its further extension and its transformation from an instrument for ordinary use into an instrument for precise and accurate thinking and expression. The laws of habit tend inevitably to confirm the practice of grasping the general meaning of an expression seen in print or heard and of utilizing somewhat stereotyped expressions which but partially and approximately convey the correct thought. Attention sinks to a low level and the conscious relationing of words to thought is minimized. Mental inertia leads to following the line of least resistance and results in the individual taking the easier path around rather than the more effortful path through the thinking process. Comparison, contrast, and selection, necessary for the development of vocabulary and language habits if they are to be made more precise and accurate, are not forced on the individual when employing his own language where its facile use permits looseness and vagueness.

(2) Closely related to the previous consideration, if not really a part of it, is the fact that our methods of education, with emphasis on the printed page, and the ordinary usages of everyday life tend to foster the development of an extensive vocabulary, portions of which consist of words and expressions whose interpretation for the individual depends largely, if not wholly, in the context in which they occur and which have such vague and ill-defined meanings for him that they are practically useless as instruments for independent thinking and expression. Here belong the passive vocabulary previously mentioned and a large number of terms which have but symbol-symbol associations and almost entirely lack symbol-thought associations.

(3) In the preceding section attention was called to the

fact that the development of language-use as an instrument for thinking and expressing thought is dependent on rendering terms more precise and more accurate and on the ordering or relationing of terms in connected thought and connected discourse. The most important study for the accomplishment of that purpose is composition. Yet it is particularly in the teaching of composition that the greatest difficulties are encountered in utilizing the English language to transform the use of that language from an instrument for the ordinary affairs and conveniences of everyday life to an instrument for precise and accurate thinking. The only way in which terms (in their intrinsic and extrinsic meanings) may be rendered more precise and accurate is through the constantly refining process of comparison, contrast, and selection of terms whose connotation and denotation more or less overlap. Such a process involves selective thinking (reasoning) which can only arise when there is a felt difficulty and can take place only when an attempt is made to solve that difficulty. But in composition it is by no means easy to render conditions favorable to that process of selective thinking which is necessary if effective comparison, contrast, and selection of terms are to be achieved. In the secondary school composition ordinarily means one of two things — either an attempt on the part of the pupil to "compose" an essay or theme out of whole cloth on a topic assigned or chosen, or to take a given piece of writing which he is to imitate or "reproduce" in expanded or constricted form. Imitative writing has nothing whatever to do with the present problem. Reproduction as far as exact thought is involved is a total impossibility in the same language. In any case it is extremely difficult if not impossible for the teacher to control or even to know the thought and vocabulary of the pupil clearly enough to enable him to direct the process of their interrelation. In writing a composition the pupil comes to a point where the right word to express his half-formed thought does not at once come to him. Does the pupil then enter on a process of reflective thinking involving comparison, contrast, and the selection of the right word? Barrie's Tommy is a rare exception and in nine cases out of ten the pupil follows the line of least resistance, walks around the boulder in his way, revamps his thought to meet the narrow confines of his customary vocabulary, and the opportunity for improvement is forever lost. Able to know the pupil's thought only as it may be expressed the teacher is powerless to prevent such "side-stepping" practice on the part of the pupil, can judge only the composition as written (or spoken), and hence can to a limited degree only control the relating of terms and language to the thought process on the part of the pupil.[1]

(4) It scarcely needs to be mentioned here that the study of language in the school is seriously handicapped by the fact that the use of language outside the school is so loose that it is extremely difficult through the English class to overcome the laxity of language-thought relating in the ordinary use of the language outside the school. The study of one's own language does not compel conscious attention to the language-thought relation without which conditions are unfavorable for the transformation of language as a tool for ordinary social use into a tool for precise and accurate thinking.

(5) Even within the school the teaching of language suffers serious limitations. Habit formation demands as one of its essential conditions that associations suffer few exceptions. Whatever habits may be successfully fostered in the English class they are commonly counteracted by interfering conditions in other classes. Unless the work in

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[1] Space limits attention here to written composition only. Oral composition suffers the same limitations.

English is closely correlated with the work of other classes, unless the relation of language and thought is carefully attended to in the study of other subjects, the constructive work of the English class will be in great part offset by the destructive work in other classes. The teaching of language usage is primarily the work of the English teacher. It is also an important part of the work of every other teacher.

Of the limitations for teaching language through the medium of the English class the first three mentioned are of great importance in connection with the study of foreign languages. The position will be taken in Chapter XIII that the most general and fundamental values of the study of foreign languages in the American secondary school are found in connection with the language-thought relation and serve to aid the study of English at the points where the limitations of the latter are greatest.

III. The Aims and Values of the Study of Literature

189. Literature and the social-civic aim of education. Whenever we deal with the social-civic aim of secondary education we deal with an aim which is general and universal. Hence, whatever study contributes directly or indirectly to the attainment of the social-civic aim must be conceived as offering general and universal values. Here the study of literature is of value in two related ways: (*a*) it affords contact with human experiences and human conduct in complete variety; (*b*) by bringing pupils into contact with the experiences, traditions, conventions, and customs of society it possesses great integrating values.

In a very important sense literature is to be conceived as a social-science study in the secondary school, when properly conducted occupying a position by no means inferior to that of history, economics, and civics. History deals primarily with group experiences and economics or sociology with abstract principles. Civics and literature both reach the field of individual conduct, but start from opposite extremes, literature dealing predominantly with individual conduct and having little to do with the formal duties of citizenship. With the thousand and one phases of everyday behavior history, sociology, and economics have little or nothing to do. Even civics in its broadest sense has relatively little to do with those phases of life's activities. On the other hand that is exactly the field where literature, in its broadest and best sense, reigns supreme. The experiences which go to determine the individual's action and conduct in the ordinary affairs of life may be provided directly or vicariously. One's environment must needs limit the direct experiences: the vicarious experiences may be provided through reading and are limited only by the opportunities and acquired habits of reading. The study of literature, properly conducted, may and should extend the range of one's experiences far beyond the limits of one's immediate environment.

Turning our attention in a somewhat different direction we may note that the study of literature may be made a powerful factor for social integration. The dominant ideals of any society, its traditions, its thought, its customs, its life are embodied in its literature. Acquaintance with national or racial literature has something more than merely conventional value. It has value as instilling in the individual all that has gone to make a society what it is and of creating in him unconsciously its own ideals, thought, and aspirations. The spiritual inheritance of the race is best conveyed to the pupil through the study of its literature.

190. **Literature and the economic-vocational aim.** Literature, as any other subject of study in the secondary-school program, may become a vocational subject for certain indi-

viduals. It is to be noted, however, that as a vocational study in the secondary school literature can have but limited values and, indeed, it may well be that attention to the vocational values of literature is entirely out of place there. Certainly this must be so save in very few cases.

If the limited vocational values of the study of literature in the secondary school were fully recognized in high-school teaching, further consideration of literature in connection with the economic-vocational aim would be superfluous. Attention was called above to the fallacy of failing to distinguish between values of production, accomplishment, or technical knowledge and values of consumption, utilization, or appreciation. This fallacy is not without exemplification in the teaching of English literature which is preëminently a subject whose dominant values are those of utilization and appreciation. No justification can be found for the extensive attention paid in many schools to the formal side of literature and to literary technique.

191. Literature and the individualistic-avocational aim. Probably no other study in the secondary-school program can compete with literature as a study contributing to the individualistic-avocational aim of secondary education. Two thousand years ago Cicero praised literature as a source of enjoyment suited to all times, all ages, and all places as contrasted with other sources of enjoyment of more limited scope. To-day his praise may be extended to apply to all individuals as well. As a universal source of enjoyment for the utilization of leisure literature affords universal values which cannot be neglected. The increasing amount o leisure afforded the individual and the increasing facilitie for "reading" make the study of literature of constantly increasing importance in the secondary school. People *will* read: what practically all people will do they must be trained how best to do. Assuming that people will read, the question becomes important as to what they will read and how they will read.

In the field of literature the social-civic and the individualistic-avocational aims of secondary education meet. In considering the latter aim the point was made that from a social viewpoint the aim of the secondary school to afford preparation for the enjoyment of life is negative in the sense that it purposes not so much to build up civilization as to prevent its impairment. In the case of teaching literature for its individualistic-avocational values the aim must be to develop such standards of taste and appreciation as may afford enjoyment to the individual without allowing those values to interfere with the social-civic values of the study. The tremendous influence of modern literature on the individual has created a problem which cannot safely be neglected by the secondary school. Some, perhaps much, of that literature is good and valuable. Much also is bad and harmful. Which of the two sorts will prove strong influences in the lives of secondary-school pupils may be determined in part by the study of literature in the school. To expect such study wholly to determine this is to expect the impossible. To attempt to establish too high a standard (especially from the artistic and æsthetic viewpoints) is in many cases to defeat the very purpose aimed at.

Have we not here the criteria of materials to be introduced in the secondary school for the study of literature? Two important values are to be attained: (*a*) the social-civic values (including moral values), and (*b*) the individualistic-avocational values (including æsthetic values). Such pieces of literature as may be made the object of study in the secondary-school course must conform to one or both of those values. Pieces of literature introduced primarily for their social-civic values must secondarily possess individualistic-avocational values or be balanced by others designed to produce such values. Pieces of literature introduced primarily for their individualistic-avocational values must secondarily possess social-civic values or at least be such as do not tend to counteract social-civic influences. Any course in literature which subordinates either of the two principal aims of the study is faulty. The maximum of values will accrue when a proper balance is maintained between the two values.

One point further requires attention before this topic is left. Since the main values of the study of literature as contributing to the social-civic aim are to be found in the influence of its content and since the main values of its study as contributing to the individualistic-avocational aim of secondary education are to be found in the development of a sense of enjoyment in reading and taste in the choice of such reading, it would appear to follow that in all cases highly formal study and attention to the technique of literature should be subordinated to those more important values. The study of literary technique, except within such limits as obviously affect the general appreciation of literature, has no place in the study of literature in the secondary school. The æsthetics of style, when carried beyond the elements and made an important part of the work in literature, benefit a few exceptional pupils, but seriously encroach on much more important phases of the work for the vast majority of pupils. It must be constantly in the mind of the teacher of literature that the values of utilization and appreciation are dominant in that subject and that high-school pupils are to be trained to utilize and appreciate literature, not to produce it, to become intelligent consumers of literature, not producers nor yet even literary critics. The former function is general and universal: the latter is extremely limited and restricted.

192. Criticism of English study as now organized. To criticize the general economy of the study of English in the American secondary school is to criticize as many economies as there are schools and is therefore hopeless except in the most general terms. Nevertheless, a number of important points deserve some attention.

(1) There is a grave tendency in many quarters to minimize the study of the language and to give disproportionate attention to the study of literature. The adequate teaching of language is an extremely difficult task. The teaching of literature sometimes appears easy. The one task is relatively irksome both to pupil and to teacher: the other is relatively pleasant. The one apparently exhibits rather indefinite and intangible results not readily measured or observed: the other exhibits rather definite and tangible results, somewhat readily measured and observed. The line of least resistance favors the greater attention to literature and in the average school the study of language *per se* suffers in consequence. For this there is no justification.

(2) A second tendency commonly manifested is that of emphasizing certain formal phases of the use of language for expression, a failure adequately to recognize the importance of the study of language as an instrument for thinking itself, and hence a failure to emphasize values which are fundamental even to the values of language for expression.

(3) The proportionate attention to either of the two important aims of the study of literature (social-civic and individualistic-avocational) tends toward an overemphasis on the individualistic-avocational side and toward a relative neglect of the social-civic side. An overemphasis in either direction is undesirable.

(4) Apparently the tendency is constant to overemphasize the formal side of literature at the risk of failing to arouse in the majority of pupils that abiding liking for "reading" which is the special purpose of the individualistic-

avocational aim of the study of literature in the secondary school.

(5) However much teachers in the secondary school may recognize the validity of the abstract proposition that responsibility for language work is theirs as well as the English teacher's, their practice is far from recognizing the responsibility. Until that proposition is as thoroughly recognized in practice as it is in theory the adequate teaching of the English language cannot be attained.

(6) In view of the general and universal values of the study of English a serious question arises when it is proposed that in certain courses (especially in vocational courses and vocational schools) attempts are made to substitute applied forms of English in special fields, e.g., "business English," for more general courses. If the moral-social, the integrating, and the avocational values of the study of literature are sound, if the fundamental values of the study of language as an instrument for thinking and for the expression of thought are valid, there can be no justification for their elimination in favor of "applied forms" of English. Wherever such forms as "business English," etc., are justified, they must be justified primarily on the basis of vocational studies and not as taking the place of studies which have an entirely different aim — social-civic or individualistic-avocational.

(7) Probably the greatest loss of efficiency in the study of English in the American secondary school results from the failure on the part of school officers, teachers, and pupils to distinguish carefully between the aims and values of the various phases of the work included under the ambiguous term "English." In the preceding analysis of aims and values it has been pointed out that a number of quite different purposes are involved in the different phases of work in the study of "English." That numerous interrelations are legitimate between these different phases is clear and it is

true that correlation and coöperation are eminently desirable. It is nevertheless true that failure to distinguish between the primary aims and values of the study of language *per se*, the study of literature for social-civic ends, and the study of literature for individualistic ends, etc., leads to confusion in the study of " English " in the average secondary school. The gravest error here is that frequently noted in the burdening of the study of literature with detailed language analysis and with elaborately formal study of the technique of literary composition. In the average "English " class the teacher either fails to analyze the special values to be emphasized in the particular phase of work involved or attempts to meet too many aims and to develop too many values at the same time.

PROBLEMS FOR FURTHER CONSIDERATION

1. What are the arguments for and against the separation of language and literature studies in secondary-school English? (Cf. Snedden, D., *Problems of Secondary Education*, pp. 171 *ff*.)
2. What differences in teaching would follow from the organization of language courses in English designed to emphasize the use of language as an instrument for the pupils' thinking rather than to emphasize his ability in expression?
3. Devise methods of testing a pupil's "passive" and "active" vocabularies.
4. Make a study of the relative proportions of time now devoted to language and literature studies in a number of different high schools.
5. What means might be devised to emphasize the relationing of language use to thought in English composition?
6. What are the arguments for and against the study of "formal grammar"?
7. What are the arguments for and against the study of logic in the secondary school?
8. Make a list of books for high-school reading which would emphasize both social and avocational values.
9. Analyze the books now commonly read in the public high schools in terms of the values suggested in this chapter.
10. Devise methods of determining the character of pupils' vocabularies on entrance to the secondary school.

11. Consider the various scales for measuring English composition with reference to the degree in which they measure the language-thought relations emphasized in this chapter.
12. Consider the various "reading tests" with reference to language-thought relations.
13. Apply various "opposites tests," "part-whole tests," "genus-species tests," etc., to secondary-school pupils. (Cf. Whipple, G. M., *Manual of Mental and Physical Tests.*)

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CHAPTER XIII

THE PLACE OF FOREIGN LANGUAGES IN THE PROGRAM OF STUDIES

193. **Historical development in America.** Attention has previously been called to the fact that during the colonial period the studies of the secondary school were exclusively linguistic and literary and were confined to Latin and Greek. The study of the ancient languages and literature, therefore, has had an unbroken history since the beginning of secondary education in America, being perpetuated through the academy and the public high school. From about 1900 the study of Greek has tended to disappear from the program of the public secondary school, its demise being assisted by the removal of the protecting influence of college admission requirement. In this connection it may be well to note that common opinion has always ascribed to the study of Greek in the public secondary school of the nineteenth century a prominence which it never really attained. As a matter of historical fact it is quite improbable that the proportion of pupils studying Greek in the public high schools of this country ever was as high as five per cent of the total enrollment.[1] The assumed popularity of Greek in the public high schools of America never was a reality.

The modern foreign languages found their way into the program of the modern secondary school via the academy which contributed the study of French and German to the early high school. Thus French was introduced into the Girls' High School of Boston as an optional subject in 1826 and into the program of the English Classical (High) School of Boston in 1836.[1] German was introduced at least as early as 1838–39 in the Central High School of Philadelphia. During the earlier period the study of French and German was upheld for its cultural values primarily. Latin sentiment and race influences extensively affected the study of the modern foreign languages, especially German. Finally, within the past decade or so, the commercial values of such study have received increased emphasis.

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[1] Inglis, A. J., *The Rise of the High School in Massachusetts*, pp. 89–94, 108–10.

The development of the study of foreign languages in the public secondary schools from 1890 to 1915 is indicated in Table CXIX. The data presented in the following table will further illustrate that development.

Table CXX. Numbers of Pupils engaged in Foreign Language Studies *

	Year	*Latin*	*German*	*French*	*Spanish*	*Greek*
Public High Schools	1890	70,411	21,338	11,858	...	6,202
	1895	153,950	39,901	22,813	...	10,859
	1900	262,767	74,408	40,395	...	14,813
	1905	341,248	137,661	62.120	...	10,002
	1910	362,548	175,083	73,161	4,920	5,511
	1915	434,925	284,294	102,516	31,743	3,351
All Secondary Schools	1890	100,144	34,208	28,032	...	12,869
	1895	205,006	58,921	45,746	...	22,159
	1900	314,856	94.873	65,684	...	24,869
	1905	391,067	160,066	89,777	...	17,158
	1910	405,502	192,933	95,671	5,283	10,739
	1915	503,985	312,358	136,131	35,148	10,671

* *Report of the United States Commissioner of Education* (1916), vol. II, pp. 487–89. The figures are actually higher since not all schools reported the necessary data.

Between 1890 and 1900 the public secondary-school enrollment increased 140 per cent, the number of pupils studying Latin increased 273 per cent, the number of pupils studying German increased 249 per cent, the number of pupils studying French increased 241 per cent, and the number of pupils studying Greek increased 139 per cent. Between 1900 and 1910 the total enrollment increased 78 per cent, the number of pupils studying Latin increased 38 per cent, the number of pupils studying German increased 135 per cent, the number of pupils studying French increased 81 per cent, and the number of pupils studying Greek decreased 63 per cent. Between 1910 and 1915 the total enrollment of the public secondary school increased 45 per cent, the number of pupils studying Latin increased 20 per cent, the number of pupils studying German increased 62 per cent, the number of pupils studying French increased 40 per cent, the number of pupils studying Greek decreased 39 per cent, and the number of pupils studying Spanish showed a noticeable increase.

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[1] First appearance in the *Regulations* for 1836; claimed for 1832.

194. **Present status.** Few, if any, high schools in the United States (other than certain special schools) fail to offer foreign languages in their programs of study. | Commonly at least two foreign languages are offered. In many high schools some foreign language study is required of the majority of pupils at some stage in the secondary school course.

Such figures as those presented in Table CXX emphasize the necessity of analyzing the values claimed to accrue from the study of foreign language, which at the present time occupies the attention of considerably more than one half of the entire number of pupils in the secondary schools and (at a rough estimate) consumes about one seventh to one fifth or more of all the time spent by all students in the secondary school. Here some comparisons with the higher-school programs of Germany and France are instructive.

TABLE CXXI. FOREIGN LANGUAGES IN THE PRUSSIAN HIGHER SCHOOLS FOR BOYS*

	Latin	*Greek*	*French*	*English*	*Total*
Gymnasium:					
Number of years studied...	9	6	7	...	...
Total number of "periods".	68	36	20	...	124
Per cent of total time......	26.3	13.9	7.7	Elective	47.9
Realgymnasium:					
Number of years studied....	9	...	7	6	...
Total number of "periods".	49	...	29	18	96
Per cent of total time......	18.7	...	11.0	6.9	36.6
Oberrealschule:					
Number of years studied ...	...	...	9	6	...
Total number of "periods".	...	...	47	25	72
Per cent of total time......	...	...	18.0	9.5	27.5

* Compiled from *Lehrpläne und Lehraufgaben fur die höheren Schulen in Preussen* (1901), pp. 4–6.

From these figures it appears that in the Prussian *Gymnasium* nearly one half of the entire course is devoted to the study of foreign languages, more than two fifths of the entire time being devoted to the study of the ancient languages. In the *Realgymnasium* nearly three eighths of the course is devoted to the study of foreign languages, about equally divided between Latin and the modern languages. In the *Oberrealschule* more than one quarter of the entire course is devoted to the modern foreign languages — French and English. It will be noted, of course, that the modern foreign languages are of much greater social and commercial value in Germany than in America.

In the French secondary school also the study of foreign languages plays an important rôle.

From the figures in Table CXXII it appears that from one fifth to one half of the course in the French *lycée* or

TABLE CXXII. FOREIGN LANGUAGES IN THE FRENCH SECONDARY SCHOOL FOR BOYS *

	Latin	*Greek*	*Modern Languages*	*Total*
Section A:				
Length of course in years..	6–7	4–5	6–7	...
Number of "periods".....	33	16	20	69
Per cent of total time.....	23.6	11.5	14.3	49.4
Section B:				
Length of course in years..	6–7	...	6–7	...
Number of "periods".....	33	...	32	65
Per cent of total time.....	23.3	...	22.6	45.9
Section C:				
Length of course in years..	6–7	...	6–7	55
Number of "periods".....	33	...	22	55
Per cent of total time.....	21.6	...	14.4	36.0
Section D:				
Length of course in years..	...	...	6–7	...
Number of "periods".....	...	...	33	33
Per cent of total time......	...	...	22.7	22.7

* *Plan d'Etudes et Programmes de l'Enseignement Secondaire des Garçons*, p. 39–177 (11th edition).

collège is devoted to the study of foreign languages, more than one fifth of the entire time being devoted to the study of Latin except in Section D. Here again comparisons with the situation in America are difficult because of the social and commercial importance of the modern foreign languages in France and because of the close relation between the Latin and French languages.

195. A preliminary analysis of aims and values. Values claimed for the study of foreign languages in the American secondary school may be readily classified under two broad heads: (1) those which arise from the relatively direct and specific use of the foreign language as a medium of communication for the expression of the user's thoughts or for the interpretation of the thoughts of others; (2) those which arise indirectly from the study of the foreign language either by the effect of that study on the language-thought relation or through the improvement of certain general mental traits. Either of these grouped values may be further subdivided Thus under the head of direct and specific values should be considered: (*a*) the use of the foreign language for purposes of social intercourse, including its use in travel, etc.; (*b*) its use for commercial purposes; (*c*) its instrumental use for reading purposes — its propædeutic values; (*d*) its social-cultural use as a means for extending one's understanding and appreciation of the literature, history, life, customs, etc., of other peoples. Under the head of indirect and general values should be considered: (*a*) the use of the study of a foreign language for the development of ability to associate language and thought in one's native tongue; (*b*) the use of the study of a foreign language to development of certain general mental traits. For purposes of further analysis in the following sections all these values may be classified as follows:

(1) Direct and specific values:
  (*a*) Social values.
  (*b*) Vocational values.
  (*c*) Instrumental-propædeutic values.
  (*d*) Social-cultural values.
(2) Indirect and general values:
  (*a*) General linguistic values.
  (*b*) General transfer values.

In spite of the recognized interrelation of these values it is profitable to consider them separately in the following sections.

196. Values for social intercourse. In attempting to estimate the direct and specific values of the study of foreign languages for purposes of social intercourse, e.g., in travel or in this country, at least three facts are obvious: (1) that such values apply to the modern languages only; (2) that such direct and specific values are undoubted and unquestioned for some individuals; (3) that such values are limited and contingent, i.e., they may be very great for a limited number of individuals and little or lacking for others. As a matter of fact they are important for a very restricted number of individuals, helpful but to an insignificant degree for a few others, and totally lacking for the great majority of secondary-school pupils. Certainly less than five per cent of the pupils who study German in the secondary schools of this country will ever have the slightest need of utilizing that language for purposes of social intercourse and certainly less than one per cent of all pupils attending the secondary school will find such values in that study. The case is much the same for the study of French for purposes of social intercourse. The contingency that such a small proportion of secondary school pupils may have this opportunity (not need) for the use of a foreign language for such purposes cannot justify any important position for the study of a foreign language in the public secondary school. The fact that in this country are large numbers of people whose native tongue is German, French, or any other tongue is an argument not for attaching importance to these languages for purposes of social intercourse but rather against any such procedure. The practice obtaining in certain communities, where racial influence is strong, of giving undue prominence to the study of a foreign language for purposes of social intercourse is distinctly un-American and contra-social.

197. **Values for commercial purposes.** In the case of the values of the study of foreign languages for commercial purposes, as in the case of values for purposes of social intercourse, the same three facts are obvious: (1) that such

values apply to the modern languages only; (2) that such direct and specific values are undoubted and unquestioned for some individuals; (3) that such values are limited and contingent. Within the past decade or so the attention of the secondary school has been directed more toward the importance of the study of foreign languages for vocational purposes. This has resulted from two facts, the recognition in the secondary schools of the vocational aim in secondary education and the recognition of the relative inefficiency of our machinery for international commerce. The values of the study of certain foreign languages for commercial use has been readily accepted as valid by the school public and by school authorities, who have, however, frequently failed to recognize that commonly such values are highly limited and highly contingent. They have failed commonly to appreciate the fact that bilingual men and women in this country are in plentiful supply in the great majority of instances and that the smattering of German, French, or Spanish gained in the secondary school does not enable the individual so equipped to compete on anything like equal terms with the German-American, the French-American, or the Spanish-American. Whether or not this be accepted as a fact it must be recognized that the annual increase in the number of those added to the commercial population who utilize German, French, or Spanish is relatively small — small out of all proportion to the number of those who leave our secondary schools equipped with some knowledge of one or more of those languages. That as high as five per cent of the pupils in the public secondary schools should study a foreign language for commercial or vocational purposes would probably be a gross over-estimate.

198. **Values for instrumental purposes.** While ordinarily stated as a quite subordinate aim of the study of foreign languages in the secondary school, the instrumental-propæ-

deutic aim of the study may deserve passing notice if for no other purpose than to call attention to the fact that it is limited and highly contingent. The claims for this value are commonly stated somewhat in this form: in the higher vocations one should be able to keep abreast with the thought and activities of those in the same vocation in other countries; to do this he must be able to read technical journals, etc., in the tongue in which they are originally written; hence he should be able to read French, German, etc. In such an argument both the necessity of such knowledge by the specialist is over-estimated and the contingency that many individuals will be concerned is over-estimated. In these days few writings of importance fail to receive notice by translation or in summary in the technical journals written in English. When such means are not adequate the expenditure of a little money for translation commonly saves much effort and produces equally valuable results. It is to be noted, too, that the contingency is practically limited to secondary-school pupils who are destined for a college course which may well include the study of a foreign language for instrumental purposes.

199. **Values for social-cultural purposes.** Beyond doubt one of the desirable results of the study of the language and literature of a foreign people may be an increased knowledge of the life, customs, institutions, thought, etc., of that people and thereby a means for the interpretation of one's own country, its life, thought, institutions, etc. The events of the present time illustrate clearly how important such international understanding may be and how important it may be to have citizens of one country understand and appreciate those of another. In this connection, however, two important problems arise: (1) How far can the ordinary course in a foreign language offered in the secondary school provide for this consummation? and (2) How far could the desirable

content elements of the study of foreign literature be provided without involving the study of the foreign language?

(1) Whatever be the possibility of deriving social-cultural values from the study of a foreign language in the secondary school we may be sure that there is a constant tendency on the part of its proponents who have enjoyed extended contact with its literature to overestimate the values commonly derived from the limited study of the secondary school pupil and to interpret those values in terms of their own extended acquaintance with the language, literature, and life of the people whose language is studied. It is at least questionable whether the secondary school pupil through a course of study which may have involved from two or three hundred hours to a thousand hours of contact with the field (a large proportion of which has been devoted to the language side pure and simple) ever approaches the point where the content values of the study assume importance for social-cultural values. Standards set by the Committee of Twelve appointed by the Modern Language Association are as follows:

TABLE CXXIII

	French			*German*		
Pages read in first two years	350	to	375	225	to	250
Pages read in third year of course	400		600	400		400
Pages read in fourth year of course	600		1000	500		500
Total for four years of study	1350	to	1975	1125	to	1150

The amount of Latin literature ordinarily read in the secondary school is about 500 to 550 pages of Cæsar, Cicero, and Vergil. How much content value (literature, history, etc.) can be gained from such a small amount of study cannot be estimated but it may well be doubted that such value is very great, especially when it is realized that greater attention is devoted to language interpretation than to the content. If, however, the ability to use the foreign language renders it possible, as it does, for the individual to continue and extend his acquaintance with the literature, life, etc., of the foreign people through further reading of that literature after completing the secondary-school course, much greater social-cultural values must be assigned to the study of the foreign languages. Unfortunately, save in the case of certain pupils who continue their education in the college, experience has shown all too clearly that the competition of literature in the mother tongue is too strong and that little is to be expected in the continued use of the foreign language after the school course is ended.

(2) The claim, readily granted, that certain social-cultural values may be derived from the study of foreign languages has raised a second issue in the question whether or not such values cannot be more easily acquired in great part at a less expenditure of time and energy, either through the study of history (for a knowledge of the life, customs, etc., of the foreign people) or through the study of translations (for acquaintance with the literature, thought, customs, etc., of that people). Here it is claimed on the one hand that by such means (somewhat indirect) much of the charm of literature and much of the characteristic spirit of a people is lost. This is doubtless true. On the other hand it is argued that it is just that finer element of "charm," just that subtler element of "spirit" that the secondary-school pupil does not and cannot get, save in very few instances, and that such elements as may be extractible from the study of the foreign language in the original and not derivable in other indirect ways for the secondary-school pupil are small out of all proportion to the amount of time and energy expended. In this connection it may be observed that the pieces of foreign literature commonly read in the secondary school are just those for which there already exist excellent translations or those which might be adequately translated with ease.

200. Summary and correlation of direct values. In the preceding sections each of the direct and specific values claimed for the study of foreign languages has been considered in isolation and it has been pointed out that each of those values is limited and contingent. This is, of course, markedly the case with respect to the study of the ancient languages where direct values are highly restricted. Thus the values of the study of Latin and Greek for purposes of social intercourse and for commercial purposes are *nil*. Their vocational and instrumental values are limited to a few professions such as the ministry, law, medicine, literature, teaching, etc. Less limited and less contingent are the social-cultural values of the study of the classical languages, but there the study is conditioned by the considerations adduced in the preceding section. In the case of the modern languages the direct and specific values of their study are much greater, but still decidedly limited and contingent.

While no single direct value of the study of foreign languages can justify any great amount of attention to those subjects in the program of studies and while their direct values are limited and contingent to a degree not ordinarily appreciated, the coördination and correlation of all those direct and specific values establishes an aggregate value which is important for the secondary-school program. The number of pupils who may properly study a modern foreign language for purposes of social intercourse, plus the number who may study it for vocational purposes, plus the number of those who may study it for instrumental-propædeutic purposes, plus the number of those who may study it for social-cultural values, gives an aggregate number of pupils who may legitimately study a foreign language in the public secondary school large enough to warrant attention to its study therein. It is obvious, however, that such direct and specific values cannot justify the study of Latin by 503,985 pupils, the study of German by 312,359 pupils, and the study of French by 136,131 pupils at any one time in the secondary schools of this country, and the prescription or semi-prescription of the study of some foreign-language study by the majority of pupils in such schools. If any such justification can be found for the prominent position which foreign-language study now occupies in the schools it must rest in part at least on different grounds than the direct and specific values. It therefore remains to consider the possible indirect and general values which have been claimed for the study of foreign languages. This is, of course, particularly true of the study of the ancient languages.

201. Foreign-language study and "general discipline." In common with most subjects in the secondary-school program the foreign languages have always been justified by their proponents in part on the basis of their values for training such general mental functions as "concentration," "accurate observation," "intelligent discrimination," "memory," "reasoning," etc. Such claims have been and are made for each of the foreign languages, but have been emphasized particularly in the case of the ancient languages for which relatively little direct and specific value can be established. An excellent example of this argument may be found in Lodge's eulogy of the study of the classical languages:[1]

> "The first and dominant object of all education is to teach the child, the boy or girl, to use his or her mind; that is, in other words, to teach them so to control their minds that they can apply them to any subject of study and especially to a subject which it is a duty and not a pleasure to master and understand. When this power to use and control the mind is once thoroughly attained, the boy or

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[1] Lodge, Senator H. C., Address before the Classical Conference at Princeton University, June 2, 1917, in West, A. F. (Editor), *Value of the Classics*, pp. 102–03.

girl can then learn anything which his or her mind is capable of receiving and acquiring. Very few minds can master every branch of learning. The man who can learn languages may be wholly unable to go beyond the rudiments of mathematics. Some minds again are much more powerful than others, just as some bodies are much more muscular than others, and are able to go further in any direction than the average intelligence. We all have our mental limitations. But it is none the less profoundly true that those who have been taught to use and control their minds can apply them to any subject and go as far as their individual limitations permit. So far all, I believe, who have reflected upon the subject will agree. I think we may also agree that as any form of exercise will develop some muscles and some forms will develop all, so any kind of study properly pursued, whether it is arithmetic or Sanscrit roots, will develop muscles of the mind and give it the power of continuous application by a mere exercise of the will.

Without attempting any detailed criticism of Senator Lodge's statements we may point out that it illustrates an argument for education which is based on a theory of the mind which has been abandoned by practically every psychologist. The thesis to which he assumes that "all who have reflected upon the subject will agree" is exactly the thesis to which every psychologist will disagree or at least question.

In considering the problem of "general discipline," we may safely discard the implications of a faculty psychology and turn our attention to the question of the transfer or spread of mental efficiency acquired in connection with the study of foreign language to non-linguistic fields. The vital question is whether efficiency gained in and through and for the study of foreign language can be generalized and made operative in other studies and activities. In Chapter XI were outlined theories of the possibility, method, and extent of the "transfer of improvement" to "generalized experience." It was there pointed out that the possibility of transfer is universally granted, that theories differ widely as to the method and extent of such transfer, and that in its ultimate analysis transfer must depend on the operation of the laws of dissociation. It was further pointed out that the degree of transfer must depend on the degree in which conditions are favorable for the operation of the laws of dissociation and therefore on the degree to which the materials of the subject may be manipulated in teaching so as to provide conditions favorable for those processes, the character of the means available, and the methods of their presentation. It is for these reasons erroneous to assume that all subjects are equally valuable for transfer or that transfer is dependent entirely on methods of teaching. Here as elsewhere the values of a subject are to be determined both by the nature of its materials and by the methods of teaching employed.

Doubtless some transfer or spread of improved efficiency is possible from the study of any subject in any manner. If such transfer is to be made extensive, however, the most favorable materials must be chosen and the most favorable methods employed with recognition of transfer as a definite end. At present neither psychological theory nor experimental evidence can afford satisfactory criteria whereby to estimate the transfer values of the study of foreign language. However, it is unjustifiably arbitrary to ignore or minimize the facts that (after the time of the Greeks) languages were almost the sole materials of formal education up to the end of the eighteenth century and the dominant materials up to the end of the nineteenth century, that the materials of foreign language study are at least favorable for exercise in mental functions of the greatest value, if transferable, that such materials are well adapted for ready manipulation and may be made favorable for transfer, and that, with the possible exception of mathematics, the long-continued study of foreign languages has developed a body of recognized teaching method approached by no other subject of study in the secondary-school program.

Pending more definite knowledge of the method and extent of the transfer of improved efficiency one may safely assume the position of the Committee on Ancient Languages, *mutatis mutandis*, for foreign language in general.[1]

> Hence the Committee suggests that teachers of Latin and those responsible for the administration of the schools be on their guard against (1) expecting too much transfer, (2) expecting too little transfer, (3) expecting transfer to be automatic. Pending the establishment of more conclusive theories of the "transfer of improved efficiency," the Committee recommends a careful analysis of the mental traits employed in the study of Latin, to determine what mental traits it is desirable to transfer from that field to other fields, what traits are actually transferred, and what other traits may be so transferred.
>
> The Committee expresses its belief that among the mental traits involved in the study of Latin wherein transfer is most to be expected will be found the following: habits of mental work, tendency to neglect distracting and irrelevant elements, ideals of thoroughness, ideals of accuracy and precision, and attitudes toward study and intellectual achievement.
>
> The character of the Latin language, the well-established organization of materials for the study of the language, and the existence of a well-defined body of methods of teaching the language contribute to the development of the values indicated above.
>
> The Committee further holds that in proportion as such potential values are consciously the aim of the work in Latin and consciously developed, in like proportion conditions are favorable to their realization as actual results of the work in Latin.

202. Values for language-thought relations. Among the claims for the values of the study of a foreign language is the claim that it aids greatly in the improvement of ability to use one's native tongue. As ordinarily presented arguments in support of that claim deal with a very vital issue in a very superficial way, being limited to etymological and vocabulary factors and almost neglecting the close relation between language use and the mental processes. Here we may revert to considerations adduced in Chapter XII. It was there stated that language is to be conceived not only as an instrument for the communication of thought, but also as an instrument for thinking itself, and that the aims and values of language study in the secondary school must recognize that fact. It was also pointed out that the problem of the school in respect to language is to transform the pupil's language into an instrument for assisting and conveying thought, i.e., to make it a flexible intellectual instrument as well as a tool for ordinary expression. Finally, Dewey's suggestions concerning the way in which this transformation is to be accomplished were interpreted to involve three elements: (1) the development of a capital stock of words; (2) the development of increasing precision and accuracy in the use of words as related to thought; (3) the development of habits of interrelating those words so as to facilitate consecutive thinking and consecutive discourse. It now remains to point out how the study of a foreign language may aid in those three processes.

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[1] *Report of the Committee on Ancient Languages*, Commission on the Reorganization of Secondary Education, Bureau of Education Bulletin.

(1) *Enlargement of vocabulary:* While the problem of the enlargement of vocabulary, in the sense of increasing the number of word symbols more or less at the command of the individual, is in many ways so closely related to the processes of rendering terms more precise and accurate tools that the two processes are perhaps best considered together, two important factors involved in the study of a foreign language may be considered here.

(*a*) Attention has been called previously to the fact that there is a constant tendency for the individual to accumulate verbal symbols, particularly abstract and general words and words representing qualities and relationships, without clear consciousness of their meanings. In the development of our use of language there comes a time when the ability to understand words heard or seen (especially in a context) far outstrips our ability to use those words to assist thought or to express thought, and only partially to grasp the thought expressed by those words when heard or seen in any new context. In the study of a foreign language, especially in the process of translation, consciousness of the meaning of the word of the mother tongue is a necessity before the thought can be interpreted, though exception to this statement must be made in cases where the term to be translated has a single equivalent in the mother tongue. That conscious attention to the meaning of terms which may be minimized in the use of the mother tongue when its use becomes more or less mechanical is highly fostered in the study of a foreign tongue, particularly in the process of translation. This arises from two facts: first, that in a large proportion of cases terms of the foreign language have not exact equivalents in the mother tongue; second, that the context does not give meaning to the specific term in the same ready way in which the context of the mother tongue has rendered aid to its interpretation.

(*b*) The amount of aid afforded to the enlargement of vocabulary by a knowledge of words in a foreign tongue from which words in the mother tongue have been derived or to which they are etymologically related is doubtless at times much exaggerated. This should, however, not blind us to the undoubted fact that such etymological values exist and ought not be minimized. The number of words in the English language derived directly or indirectly from the Latin has been estimated as high as fifty or sixty per cent of our total vocabulary. The number of words derived directly or indirectly from Greek has been estimated as high as twelve per cent. The number of words derived from

French has been estimated as high as one third of our total vocabulary. The Anglo-Saxon element of our language is closely related etymologically to the German as a member of the same family of languages. These are facts which cannot safely be completely ignored. It should be noted also that words of the English language derived from Greek, Latin, and French sources are those most closely related to precise and accurate meanings (many were introduced for that very purpose), while our Anglo-Saxon words are the more common terms for " ordinary affairs and conveniences."

(2) *Rendering terms more precise and accurate instruments of thought and expression:* The enlargement of the capital stock of vocabulary and the rendering it more precise and accurate are in reality part and parcel of the same process when properly conducted, and in dealing with the enlargement of the vocabulary through the study of a foreign language we have already encroached to some extent on the present topic. In this specific connection importance may be attached to the study of a foreign language because of the practice which it affords in relating words to the thought. Terms in any one language seldom have exact equivalents in any other language. Hence the interpretation of one language in terms of another necessarily involves a constant comparison and weighing of terms more or less similar, a selection and choice of the correct words to express the thought, and a judgment of the thought to be conveyed by the word or words employed. Thus, consider the amount of comparison, discrimination, and choice involved in the translation of the Latin word *res* under varying conditions — *thing*, *object*, *event*, *circumstance*, *occurrence*, *matter*, *condition*, *situation*, *act*, *property*, *factor*, *fact*, *reality*, *effect*, *substance*, *possession*, *benefit*, *profit*, *advantage*, *interest*, *weal*, *cause*, *reason*, *ground*, *account*, *business*, *case*, *suit*, etc., etc.

Now, increased precision and accuracy in the use of language and thought must result almost exclusively from practice in comparing, discriminating, and selecting the appropriate word for the desired thought element, and conditions favorable for such comparison, discrimination, and selection for the better relationing of words and thought are those which do not merely permit, but actually demand, the operation of those processes. Those conditions may be amply provided in the study of a foreign language.

It is to be noted in this connection that, wherever single exact equivalents are associated in the foreign and the mother tongues, no such comparison, discrimination, selection, and relationing can result, the mere substitution of symbols results, and hence increased precision and accuracy is impossible. Since the proportion of exact equivalents differs in the various foreign languages this factor permits some measure of the relative values of the study of foreign languages with reference to those now under consideration. It is to be noted also that such values as those considered in the preceding paragraphs involve the close relationing of English and the foreign language with emphasis on translation, etc., a fact to be recognized as an element affecting the question of methods of teaching foreign languages which will be briefly discussed in a later section.

(3) *The development of habits of interrelating words so as to facilitate consecutive thinking and consecutive discourse:* Here possibly more than in any other respect the study of a foreign language may assist expression and thought. The English language, with its unusually large vocabulary of words borrowed from almost every possible source, with its abundance of approximate synonyms well adapted to express numerous shades of meaning and to permit extensive discrimination in thinking and expression, is well adapted to its needs as an instrument of expression and for intellec-

tual enterprises. To these ends also it is well adapted by reason of the relative flexibility which permits its easy manipulation. However, acquired in the early stages for purposes of social intercourse and employed commonly for purposes of everyday use in circumstances which do not emphasize its use as a precise and accurate instrument of thinking or expression, its use does not enforce such conscious relationing of words and expressions as is involved in the use of a more synthetic language. Without a certain amount of such conscious relationing conditions are not favorable for the transformation of the use of language for the ordinary affairs of everyday life into its use as an intellectual instrument.

It is just here that the study of a foreign language, especially a language which is more synthetic, may be made of service for the accomplishment of such a transformation. In the study of a foreign language that conscious relationing of terms and phrases not only may but must take place and wherever translation is involved it must take place in the mother tongue as well as in the foreign language. Such a process becomes necessary as a result of vocabulary differences previously emphasized and as a result of differences in word order and differences in inflectional usages in the mother tongue and in the foreign language.

In the entire discussion of this section it is to be noted that there is emphasized not a transfer of elements from one language to another, not a transfer of mental functions, but the development of improved efficiency in the use of the mother tongue as related to the mental elements which can be grasped and retained only by means of its terms. In other words there is involved no question of general discipline or transfer except as language, operating as an instrument in all intellectual enterprises, may be considered a common element in the training and application situations.

203. The mother tongue and foreign languages. It is important to remember that in the study of the mother tongue and in the study of a foreign language one of the most fundamental objectives is in many respects the same — the development of an ability to employ language (the mother tongue) as an instrument for thinking and for expression, as an intellectual instrument and as a social instrument. It is important also to remember that, while the use of language in both respects must ultimately be manifested in the use of the mother tongue, there is really involved a change in the mental processes which underly language use, i.e., the relation of language to mental life must constantly be kept in mind. If this theory be recognized as valid it must be recognized also that the general values of the study of the mother tongue and the indirect values of the study of a foreign language involve much the same problem.

One of the most important and most persistent problems involved in the study of foreign languages in the secondary school raises the question whether it would not be better to devote more attention to the mother tongue and less to the foreign languages, whether more value could be gained from a relatively short additional period devoted to the study of English than from the relatively long period now devoted to the study of foreign languages. Two separate questions are involved here, one affecting the matter of direct social-cultural values, the other affecting the matter of indirect linguistic values.

(*1*) *Direct values:* Among the direct values commonly claimed for the study of foreign languages were mentioned: (*a*) social-intercourse values; (*b*) vocational values; (*c*) instrumental-propædeutic values; (*d*) social-cultural values All those values may be justified to some extent when considered limited and contingent. The only serious point of conflict between the values of the study of English and the study of a foreign language, as far as direct values are concerned, is found in connection with the social-cultural values claimed for the study of a foreign language. Here the question arises whether the time devoted to the study of a foreign language for the purpose of becoming acquainted with foreign literature, history, life, etc., through the medium of the foreign language can be justified when many of those values can be attained through the medium of the mother tongue or can be evaluated in relation to other studies carried on through the mother tongue. This point has already been considered in a preceding section. It need only be repeated here that it is very doubtful that the study of a foreign language can be justified for secondary-school pupils in any high degree on the basis of such values.

(2) *Indirect values:* The indirect values commonly claimed for the study of a foreign language were classified as: (*a*) transfer values; (*b*) general linguistic values. Concerning the transfer values little can be said here further than has already been said in chapter XI. This much, however, may be added, that methods, habits, ideals, and attitudes cannot be transferred unless they are actually developed in the original training. It requires little examination to learn that as yet the teaching of English has failed to secure methods, habits, ideals, and attitudes of learning comparable to those secured in the teaching of foreign languages. Whether or not transfer is possible, this much is sure, that nothing can be transferred to other fields which has not been developed in the original training situation.

The most important problem involved in the attempt to evaluate the study of the mother tongue and the study of a foreign language is found in connection with the relative merits of the two as helps in the employment of language as an instrument for intellectual enterprises and the communication of thought. Attention has previously been called to the fact that the teaching of English suffers from some serious limitations, most of which arise from the fact that it is difficult to employ the language which is used primarily for purposes of everyday affairs for the purpose of converting that same instrument into a tool for the handling of precise and accurate notions. Training pupils in language use through composition, for example, suffers from the fact that the teacher can tell only that what the pupil says or writes expresses something intelligible: he cannot tell that it expresses correctly and clearly what the pupil was striving to express. In other words he cannot relate the pupil's English to the pupil's thought. On the other hand, in the translation of a passage in a foreign language the exact thought to be interpreted is a known factor and the teacher presumedly knows what use of the mother tongue will precisely and accurately express that thought. For the teacher to know that the pupil is properly relating language to thought he must know both the thought to be expressed and the language in which it should be expressed. This is possible in a foreign language: it is impossible in employing English alone. In all this it is, of course, to be noted that detailed word relationing is the important element. The interpretation of larger thought units, the general plot, or argument, is quite another matter. The problem here involved is the improvement of language use, not the interpretation in general terms of content.

The very facility with which the pupil employes his mother tongue in ways adequate for the ordinary affairs and conveniences of everyday life is one of the greatest handicaps to the attempt to convert it into a more effective intellectual instrument. The pupil rebels against attempts to improve an instrument which is quite satisfactory to his immature mind.

204. **The relative values of foreign languages.** The

preceding considerations have established some criteria for judging the relative values of the study of the different foreign languages commonly found in the program of the secondary school. Some limited application of those criteria may be made here.

(*1*) *Direct values, with emphasis on direct and specific use:* For purpose of social intercourse and for commercial purposes it is clear that the values of the ancient languages, Latin and Greek, are nil and the values of the modern languages, while high, are limited to a relatively small number of individuals and for the majority of secondary-school pupils are very contingent. For certain other vocational purposes, for instrumental-propædeutic purposes all study of foreign language is limited and contingent. For social-cultural purposes it would be difficult to estimate the relative values of the different foreign languages. He would be a daring individual who would attempt to estimate the relative social-cultural values of Greek, Roman, German, French, and Spanish civilizations for the American citizen. It should be remembered also that here values are doubtful in view of the possibility of attaining them more economically through the medium of translations and through the study of the social sciences.

(*2*) *Indirect values, with emphasis on general values and the learning process:* The unsatisfactory nature of our knowledge of transfer values makes it an almost hopeless task to attempt to estimate transfer values of the various foreign languages. If such values exist to an appreciable extent it is a tenable thesis that the differences which are found between the analytic character of English, French, and Spanish, and the synthetic character of German, Latin, and Greek, may make a difference in transfer values between the two groups. The writer would hazard as an *a-priori* estimate the transfer values of foreign-language study, the ascending order as follows: Spanish, French, German, Greek, Latin. Numerous investigations have been made of the relative standing of pupils studying different foreign languages in the secondary school. The results of those investigations have almost invariably indicated some superiority in favor of those studying Latin. However, the investigations themselves have been so unsatisfactory for the most part that little dependence can be placed on the results, largely because they have failed to show whether that superiority was due to the effect of the study of Latin or to the fact that pupils of higher selection study Latin.[1]

That the study of a foreign language contributes something to one's ability to use his own language can scarcely be disputed. The pertinent questions are: What is the amount of that contribution? and, What are the relative values of different foreign languages for that purpose? The first of these two questions has been considered above and the ground taken that the amount of that contribution affords justification for the study of a foreign language by secondary-school pupils. The second question remains to be considered. What are the relative linguistic values of the study of Spanish, French, German, Greek, Latin? The answer to this question will be considered, first, in *a-priori* theory, and, secondly, by interpreting the results of experimental investigations.

In the *a-priori* theory presented in preceding sections it was pointed out that the study of a foreign language assists in the development of linguistic ability by increasing the extent of vocabulary, by rendering vocabulary more precise and accurate as an intellectual instrument, and by aiding the development of habits of interrelating words so as to facilitate consecutive thinking and consecutive discourse. It was pointed out also that vocabulary development is assisted through the study of a foreign language by the addition of new terms, by the necessary comparison, discrimination, and selection of terms as related to thought elements. One measure, therefore, of the relative values of the study of foreign languages is to be found in the differences in their vocabularies demanding careful comparison, discrimination, and selection of terms in the mother tongue as expressing the intended thought. Now in this respect there is a great difference between the modern languages and the ancient languages. The modern languages all express modern thought in the modern way. Both the thought and the manner of expressing the thought are much closer in the case of modern languages than in the case of an ancient language and a modern language. At first thought this might appear to offer an advantage in favor of the study of a modern language. The opposite is, however, the case where not content but practice in comparison, discrimination, and selection are the important elements involved. The closer the vocabulary and the manner of expressing thought in the case of two languages the less is the opportunity and necessity for those elements. The more different the vocabularies and the manner of expressing thought the greater is the opportunity and necessity for careful comparison, discrimination, and selection without which the interpretation into the mother tongue is of little value other than for content. If this be true we cannot do otherwise than assign superiority to the study of Latin and Greek as far as these linguistic values alone are concerned.

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[1] Cf. correlation studies by Burris, W. P., Wissler, C., Parker, S. C. Brinkerhoff, Morris, and Thorndike — all quoted by Thorndike, E. L., *Educational Psychology* (1903 edition), pp. 35–38; Dotey, A. I., reported by Strayer, G. D., *The Abilities of Special Groups of High-School Students in the Subjects which they Studied, School Review Monographs*, vol. III, pp. 7–11; Starch, D., "Some Experimental Data on the Value of Studying Foreign Languages," *School Review*, vol. XXIII, pp. 697–703; vol. XXV, pp. 241–48.

In developing habits of interrelating words for the purpose of facilitating consecutive thought and consecutive discourse also it was suggested that assistance may be rendered by the study of a foreign language through practice in analyzing related terms and expressions. Here the factors involved in evaluating foreign languages as assisting this process are (*a*) differences in word order, and (*b*) differences in inflectional and syntactical usages. The greater these differences, the greater the necessity imposed on the pupil of consciously attending to the interrelating of terms employed for the expression of thought. In point of the amount of difference in word order there can be no hesitation in classifying the Romance languages, French and Spanish, in a class closely similar to English, classifying Latin and Greek as far removed from English, and German as occupying a position between the other two classes, nearer the first than the second. Such values as arise here affect the languages in ascending order: French and Spanish, German, Greek, Latin. In point of the amount of difference in inflectional and syntactical usages the classification would place French and Spanish relatively close to English, German, Latin, and Greek relatively remote from English.

Experimental investigations of the relative values of the foreign languages as studies are more numerous than valuable or reliable. As samples we may consider two investigations, one of which is claimed to indicate great improvement of linguistic ability as the result of the study of Latin as compared with the results of the study of German, the other held by the investigator to indicate little improvement as the result of the study of Latin.

(*a*) Perkins conducted an experiment in the commerical department of the Dorchester (Massachusetts) High School where the study of Latin had been introduced as an elective in the commercial courses on the theory that it would improve the use and understanding of the pupils' English.

After the course had been put into operation and had approved itself to the empirical judgment of those responsible an attempt was made to secure quantitative measurements of the results. The methods employed and the results obtained may be stated in the investigator's words:[1]

> Obviously, the first step was to select two sets of pupils of equal ability, one set in the second year of Latin, and the other in the second year of a modern language. Accordingly we chose pupils such that each group had virtually the same average mark in Latin, on the one hand, and modern language, on the other, and also in English, with the result, in actual figures, that the non-Latin group in the two studies averages 0.5 of 1 per cent the higher. To make doubly sure that the Latin pupils were not favored, the non-Latin group were taken from the section of Mr. Murdock, a classical scholar, who in his English teaching emphasizes the Latin element in the language. There were twenty-five in each set, all in the second year of the school.

Six measurements were made with the results indicated in the following table.

TABLE CXXIV

Tests	*Averages of groups*	
	Latin (per cent)	*German (per cent)*
1. Spelling	82.5	72.6
2. Use of words in sentences	57.5	40.6
3. Definitions and parts of speech	69.5	33.3
4. Meanings of words and spelling (first test)	57.0	27.5
5. Excellence in vocabulary	36.0	6.8
6. Meaning of words and spelling (second test)	65.3	12.3

If anything this table proves too much.

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[1] Perkins, A. S., "Latin as a Vocational Study in the Commercial Course," *The Classical Journal*, vol. x, pp. 7–16; cf. also same "Latin as a 'Practical' Study," *The Classical Journal*, vol. VIII, no. 7.

Starch investigated a number of phases of the relation of the study of foreign languages to linguistic development. Some of the results obtained are indicated in the following tables.[1]

TABLE CXXV. MEDIAN GRADES IN (UNIVERSITY) FRESHMAN ENGLISH

54 students who entered with Latin only........	83.9 per cent
97 students who entered with German only......	82.7 per cent

TABLE CXXVI. SIZE OF VOCABULARY OF LATIN AND NON-LATIN STUDENTS

	University students		*High-school juniors*	
	Number	*Grade per cent*	*Number*	*Grade per cent*
Latin groups...........	139	60.9	14	54.7
Non-Latin group........	50	58.2	32	50.2

TABLE CXXVII. EFFECT OF FOREIGN-LANGUAGE STUDY ON KNOWLEDGE OF GRAMMAR AND USAGE: HIGH-SCHOOL PUPILS

Years of foreign-language study	*Number of pupils*	*Average scores for knowledge of grammar*	*Average scores for correctness of usage*
0...........................	12	14.7	32.2
8 weeks.....................	50	20.8	43.0
1 year......................	18	25.5	43.4
2 years.....................	39	24.8	45.9
3 years.....................	27	28.6	47.7

205. The place of foreign languages. The place which instruction in foreign languages is to occupy in the American secondary school must be determined by the relative importance which is to be attached to the different values considered in the preceding sections. Until within recent years the greater importance has been attached to the indirect and general values ascribed to the study of a foreign language Within recent years the tendency has been in the direction of emphasis on the direct values of such study. If that tendency proceeds to its logical end it must be recognized that the relative prominence heretofore given to foreign language should be greatly decreased, since those direct values are limited and contingent. On the other hand, if recognition is to be given to indirect and general values, rather extensive attention must be given to the study of foreign languages. Justification for the large proportion of secondary-school pupils at present studying foreign languages and for the amount of time at present devoted to the study of foreign languages in the secondary school cannot be found on the basis of direct and immediately utilitarian values. On the other hand, if claims for general and indirect values are valid, some grounds may be found for considerable attention to foreign-language study.

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[1] Starch., D., *loc. cit.*

While any adequate consideration of methods of teaching a foreign language cannot be attempted here, it may be noted in passing that if direct values alone are to determine the aims of foreign language instruction there can be no doubt that the so-called "direct methods" in some form must obtain. On the other hand, if the aims are dominantly determined by the indirect values great importance must be attached to the use of the mother tongue and to translation. In the majority of classes it is altogether probable that methods of teaching are demanded which emphasize the best elements of the "direct method" without sacrificing the importance of the mother tongue and without neglecting the values of translation.

PROBLEMS FOR FURTHER CONSIDERATION

1. Make a survey of the commercial houses of any town and ascertain the demand for those who have a knowledge of foreign languages for commercial purposes.
2. Analyze the work in German or French in any high school to determine what social-cultural values are involved.
3. To what extent is a knowledge of Latin or Greek valuable to a lawyer? — to a physician? — to a clergyman?
4. Evaluate the various methods of teaching a modern foreign language in terms of the values considered in this chapter.
5. In a large high school carry out the following experiment: From pupils now in the senior class select two groups, group 1 composed of those who studied one and only one foreign language during the sophomore years, group 2 composed of those who in the freshman and sophomore years studied no foreign language; examine the grades in English received by those pupils in the last grade of the elementary school or the work of the first term of the high school; pair off pupils in the two original groups according to the grades received in the earlier work in English, so as to secure two groups of equal English ability as thus measured, leaving exceptional cases out of further consideration. Compare the relative standing in English in the junior year of the high school of the two groups. Compare their relative standing in all other high-school work in the junior year.
6. Devise a study of the relative accomplishment of students studying Latin or French, or German, somewhat along the lines laid down in the above.
7. In any high school estimate as nearly as possible the numbers of pupils who may properly study a foreign language for its direct-use values.
8. Make a study of the college-entrance requirements in foreign languages.
9. In any high school determine the proportions of pupils who drop Latin, French, or German after one year of study; after two years: after three years.
10. What are the arguments for and against the study of a foreign languag in the first or second year of the junior high school, i.e., at about the ages of 12–13.
11. What are the arguments for and against the requirement of some foreign-language study some time in the secondary-school course?

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CHAPTER XIV

THE PLACE OF MATHEMATICS IN THE PROGRAM OF STUDIES

206. Historical development of the study of mathematics. In the history of secondary education mathematics has held a position second only to the classical languages and literatures. While the study had appeared in the secondary schools of Europe in some instances before the beginning of secondary education in America, it had never gained a firm foothold, appearing but occasionally in the form of elementary arithmetic. In the Latin grammar schools of the American colonies elementary instruction in arithmetic appeared in some cases at an early period but never became prominent until about the beginning of the nineteenth century. In the Public Latin School of Boston, for example, it was not until some time between 1814 and 1828 that arithmetic, algebra, geometry, and trigonometry were introduced.

Meanwhile impetus had been given to the study of mathematics in the academy, beginning in the Franklin Academy with its separate mathematical department. It soon spread to nearly every academy established. Thus, when the high-school movement began in the third decade of the nineteenth century, mathematics had already found a place in the secondary-school program, and in the first program of the English Classical (High) School of Boston in 1821 were included arithmetic, algebra, geometry, trigonometry, navigation, surveying, and mensuration. Thus also by the Massachusetts act of 1827 (the first high-school law in America) the teaching of algebra, geometry, and surveying was made mandatory in the high school of every town in the State having a population of five hundred families or over. As the high-school movement spread during the nineteenth century, mathematics (algebra, geometry, and trigonometry), became a regular part of the program in high schools throughout the country.

Up to the beginning of the nineteenth century a knowledge of the fundamentals of arithmetic constituted the only requirement in mathematics for college entrance, and that requirement was not universal until that time. Algebra was made an admission requirement at Harvard in 1820 and in many other colleges by the middle of the century. By that time also geometry had begun to find a place in college-entrance requirements. By 1875 algebra and geometry had become firmly established as college-entrance requirements and in most colleges have been thus retained up to the present. In 1912 every college which prescribed any subject other than English prescribed algebra and geometry.

The position which mathematics has occupied in the program of the public secondary school for the period 1890 to 1915 may be seen from the figures presented in Table CXIX. Those figures indicate that during the greater part of that period at any one time approximately one half of all pupils were engaged in studying algebra and nearly one quarter in studying geometry.

From this brief résumé it may be seen that the study of mathematics in the American secondary school possesses all the advantages and all the disadvantages which arise from the prestige of tradition. As a result of its important position in the program of studies it has developed a body of material and method of teaching which is well-organized and standardized. Its actual values have doubtless been enhanced in the minds of the public by the force of tradition. It has benefited by the fostering protection of college-entrance requirements which have been powerful influences determining the character and place of mathematics in the secondary school.

207. Present status of mathematics instruction. With the possible exception of a few special-type schools practically every secondary school in the United States includes algebra and plane geometry in its program of studies and in most schools those subjects are rigidly prescribed for the majority of pupils. Hence a very large proportion of pupils in the secondary school are always engaged in the study of mathematics, few pupils pass through the first part of their secondary education without some contact with the subject, and a measurably large proportion of the total time devoted to secondary education is occupied in the study of mathematics. The latest available returns (those for 1914–15) indicate the following figures for the numbers of pupils engaged in mathematical studies.

TABLE CXXVIII. PUPILS ENGAGED IN MATHEMATICAL STUDIES 1914–15 *

	Public schools		*Private schools*		*All schools*	
Algebra	569,215	48.84%	66,801	53.15%	636,016	49.26%
Geometry	309,383	26.55	36,681	29.18	346,064	26.80
Trigonometry	17,220	1.48	5,258	4.18	22,478	1.74
Total	895,818	76.87	108,740	86.51	1,004,558	77.80

* *Report of the United States Commissioner of Education* (1916), vol. II, pp. 487–89. Tl relatively small amount of overlapping permits totaling.

Where algebra is studied five periods per week for one year and geometry for a like amount of time about one eighth of the total time of a pupil who remains four years in the secondary school is devoted to mathematics. If he remains one or two years about one fourth of his total time is devoted to mathematics. Schools in which less than that amount of time is devoted to mathematics are fewer than schools in which a greater amount of time is devoted to it. Mathematics, however, is seldom required for all pupils throughout the course, and in this respect our practice differs from practice in Prussia and France. Conditions in Prussia may be seen from the following figures.

TABLE CXXIX *

	Length of course in years	*Total number of periods* †	*Per cent of total time*
Gymnasium	9	34	13.1
Realgymnasium	9	42	16.0
Oberrealschule	9	47	17.9

* *Lehrpläne und Lehraufgaben für die höheren Schulen in Preussen* (1901), pp. 4–6.
† Cf. Tables LXXXIV–LXXXVII.

Until within recent years the theory was almost universal that mathematics (of a higher grade than arithmetic) should be required of all pupils passing through the secondary school. Thus in the programs suggested by the Committee of Ten in 1893 four periods per week of algebra were prescribed for all pupils in all courses in the first year of the high school, three periods of geometry per week in the second year, two periods of algebra and two periods of geometry in the third year. In addition the Committee provided an option of three periods of trigonometry and higher algebra in the fourth year.[1] Even more urgent were the recommendations of the Committee on College Entrance Requirements through its sub-committee on mathematics in 1899, when it stated that: "To the close of the secondary-school course the required work in mathematics should be the same for all pupils," and that "In the secondary school, work in mathematics should be required of all pupils throughout each of the four years of the course."[1]

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[1] United States Bureau of Education, *Report of the Committee on Secondary School Studies*, pp. 46–47.

A reaction against such a conception has been growing in force within the past decade or two, the bases for that reaction being found: (1) in an increased recognition of the factor of individual differences in the capacities, abilities, interests, and probable futures of pupils; (2) in an increased recognition of the needs of children who leave before the close of the high-school course, especially their vocational and social needs; (3) in a re-interpretation and re-direction of theories of the transfer of improved efficiency; (4) a lessening of the influence of the colleges over the secondary school; (5) changing conceptions of the social functions of the public secondary school; and (6) a recognition of the meaning of retardation and elimination.

208. Preliminary analysis of aims and values. For purposes of analysis the values commonly claimed for the study of secondary-school mathematics may profitably be considered under two general headings: (1) those values which arise from the relatively direct and specific use of mathematics; (2) those values which may arise indirectly through the development of mathematical concepts or through the transfer of improved efficiency. Either of these grouped values may again be subdivided. Thus under the head of direct and specific values should be considered: (*a*) the values of mathematics as measured by the directly practical application of its principles and processes to those affairs of life common to most people whatever be their vocations; (*b*) the values of mathematics as measured by the directly practical application of its principles and processes in special professions or special parts of certain vocations; (*c*) the values of mathematics as measured by the direct application of its principles and processes to other sciences. Under the head of indirect values may be considered: (*a*) values claimed to arise from the study of mathematics as measured by the development of generally valuable concepts of number and space relations, together with the development of certain mathematical thought modes; (*b*) the values claimed to arise from the study of mathematics as measured by the transfer or spread to other fields of improved efficiency gained in that field. For the purpose of further analysis in the following sections those claimed values may be classified and considered under the following heads:

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[1] *Report of the Committee on College Entrance Requirements* (July, 1899), published by the National Educational Association, University of Chicago Press, p. 148.

(1) Direct and specific use values:
    (*a*) General use values;
    (*b*) Specific vocational values;
    (*c*) Propædeutic values.
(2) Indirect and general values:
    (*a*) Conceptual values;
    (*b*) Transfer values.

The interrelation of these values is recognized. Nevertheless separate analysis of each group is profitable.

209. Mathematics in the affairs of everyday life.

There is no subject, except the use of the mother tongue, which is so intimately connected with everyday life, and so necessary to the successful conduct of affairs. Wherever we turn in these days of iron, steam, and electricity, we find that mathematics has been the pioneer and guarantees the results. Were its backbone of mathematics removed, our material civilization would inevitably collapse.

But widespread as are the applications of mathematics and enormous as is its practical value, it may be justly urged that to the large majority of people its importance, though great, is *indirect*, and that the average citizen has but little need of mathe-

> matical facts, or even an opportunity to use them beyond the merest elements of arithmetic.[1]

In this passage Young has well stated a truth almost universally recognized by the mathematician but frequently ignored by the layman and even by schoolmen, who often fall into one or both of two fallacies by (*a*) failing to recognize the relative values of different parts of a field of knowledge which go under the same name, or (*b*) failing to distinguish between knowledge which is of universal value to civilization through a relatively few specialists and that which all should possess.[2] The second fallacy is recognized by Schultze:[3]

> It would be an error to infer, from the great usefulness of mathematics to our civilization, an equal practical usefulness to every individual. The percentage of students who are likely to have practical use for mathematics, after leaving school or college, is certainly small.

And by Yocum[4] who

> emphasizes the distinction ignored by Mr. Spencer between subject matter useful to the race through the specialist, and subject matter directly useful to the majority of individuals who are not specialists.

Little of the secondary-school mathematics as it is now organized can be considered of direct value to the average individual for the practical purposes of everyday life. The general-use values of secondary-school mathematics are small.

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[1] Young, J. W. A., *The Teaching of Mathematics*, p. 13. This and other extracts are quoted with the permission of the publishers, Longmans, Green & Co.

[2] Cf. Section 165.

[3] Schultze, A., *The Teaching of Mathematics in Secondary Schools*, pp. 17–18. This and other extracts are quoted with the permission of the publishers, The Macmillan Company.

[4] Yocum, A. D., "Mathematics as a Means to Culture and Discipline," *The Mathematics Teacher*, vol. VI, p. 136.

210. Mathematics in various vocations.

> A subject is also valuable as preparation for the contingency that the child in the future may take up an occupation requiring knowledge of the subject in question. For mathematics this value is marked, because there is a large and growing number of occupations which require a knowledge of mathematical results.[1]

It must be recognized that certain occupations call for an extended knowledge not only of mathematical results, but also of mathematical principles and processes. The number of persons engaged in such occupations is small. Many other occupations call for some knowledge of mathematical *results.* A knowledge or use of mathematical results is, however, a far different thing from a knowledge of mathematical principles and processes or the ability to derive mathematical results. In the majority of occupations which involve the use of mathematical results those who employ them commonly depend on fairly simple formulæ which ordinarily are reduced to arithmetical terms in tables. This is recognized by Schultze:[2]

> The majority of business or professional callings require no algebra, geometry, or trigonometry, and even the professions which use those subjects do so to a much smaller extent than is generally supposed. There are navigators, surveyors, and engineers who make their calculations in an almost mechanical manner, without having perfectly clear notions of the underlying mathematical principles. Only for those few men who become original designers and investigators is true mathematical skill and knowledge indispensable.

And by Smith:[3]

> It is well to understand, in the first place, that geometry is not studied, and never has been studied, because of its positive utility in commercial life or even in the workshop. . . .

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[1] Young, J. W. A., *op. cit.*, p. 14. [2] Schultze, A., *op. cit.*, p. 18.

[3] Smith, D. E., *The Teaching of Geometry*, pp. 7, 90.

> All the facts (of geometry) that a skilled mechanic or an engineer would ever need could be taught in a few lessons. All the rest is either obvious or is commercially and technically useless.
>
> The actual amount of algebra needed by a foreman in a machine shop can be taught in about four lessons, and the geometry or mensuration that he needs can be taught in eight lessons at the most. The necessary trigonometry may take eight more. . . .

The values of secondary-school mathematics (or some parts of it) are undoubted for some parts of certain professions. They are, however, less than is commonly thought and must be considered as highly contingent for most pupils.

211. The propædeutic values of mathematics.

> So completely is nature mathematical that some of the more exact natural sciences, in particular astronomy and physics, are in their theoretic phases largely mathematical in character, while other sciences which have hitherto been compelled by the complexity of their phenomena and the inexactitude of their data to remain descriptive and empirical, are developing towards the mathematical ideal, proceeding upon the fundamental assumption that mathematical relations *exist* between the forces and the phenomena, and that nothing short of the discovery and formulations of these relations would constitute definitive knowledge of the subject. Progress is measured by the closeness of the approximation to this ideal formulation.[1]

That a knowledge of mathematical results, principles, and processes is requisite for advanced work in the various sciences, mental and social as well as material, is obvious. Propædeutic values are real values for the study of mathematics. It should be obvious, however, that for secondary-school pupils those values are limited and contingent. As propædeutic for secondary-school science and the elementary science courses in college the values of secondary-school mathematics is commonly over-estimated, though attention has frequently been called to the very small amount of mathematical knowledge required for effective study of physics and chemistry. Thus Milliken:[1]

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[1] Young, J. W. A., *op. cit.*, p. 15; cf. Schultze, A., *op. cit.*, p. 15.

> There is no mathematics needed in elementary physics even as it is now, except the simplest algebraic equations with one unknown, and the single geometrical proposition of the proportionality of the sides of similar triangles.

On the whole it is probably safe to say that the number of pupils for whom the propædeutic values of the study of mathematics are appreciably important is relatively small, being somewhat less than the number of pupils who continue their education beyond the secondary-school stage.

212. **Direct values limited and contingent.** Critics of the study of supra-arithmetical mathematics are almost unanimous in their judgments that the study of algebra, geometry, and other higher mathematics in the secondary school, as they are at present organized, cannot be justified for all pupils or even for any large proportion of pupils on the basis of their direct and specific values. Thus Schultze:[2]

> If mathematics, however, had no value as a mental discipline, its teaching in the secondary schools could hardly be justified solely on grounds of its bread-and-butter value.

And Karpinski:[3]

> The practical side of mathematics has frequently been overemphasized in popular discussions of its function. . . . And yet, were we to confine the instruction in arithmetic, geometry, algebra, and trigonometry to these phases which enjoy a reasonable measure of actual application, the time devoted to these subjects could be cut in half. Mathematical instruction must justify itself as educational material aside from its applied values.

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[1] Milliken, R. A., *School and Society*, vol. III, p. 167.

[2] Schultze, A., *op. cit.*, p. 18.

[3] Karpinski, L. C., p. 132, of Johnston, C. H. (Editor), *High-School Education.*

And Young:[1]

> The average citizen has but little need of mathematical facts, or even opportunity to use them beyond the merest elements of arithmetic.

In interpreting such statements as these three facts should be kept in mind: (1) that the direct and specific values of algebra, geometry, and other secondary-school mathematics as at present organized must always be *limited* to certain groups of pupils and cannot be universal; (2) that they are *contingent* rather than certain; (3) that the statements refer to mathematics as organized into systematic sciences, wherein logical and purely mathematical relationships determine the choice and arrangement of materials and the methods of their presentation in teaching. Points (1) and (2) have already been considered. Point (3) deserves some further consideration.

For pupils who may become mathematical specialists or who may have opportunity to employ mathematical facts, principles, and processes extensively in advanced work, systematic and logically organized courses in algebra, geometry, and other higher mathematics, are justified on the basis of their direct values. For other pupils no such justification can be found. On the other hand, there are certain mathematical facts, principles, and processes, involved in those subjects, which are of sufficiently common application in the affairs of life to warrant their acquirement on the part of many if not most individuals. Here are to be considered elements classified by Yocum:[2]

> (1) All mathematical material specifically useful to those not specialists, that is sufficiently many-sided and recurring in its applications or essential in some unique usefulness, to be made definite and certain for all. . . .

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[1] Young, J. W. A., *op. cit.*, p. 13.

[2] Yocum, A. D., "Mathematics as a Means to Culture and Discipline," *The Mathematics Teacher*, vol. VI, pp. 136–37.

> (2) All mathematical material sufficiently useful to those not specialists which, while not sufficiently many-sided and recurring to be made certain for all, is many-sided and recurring enough and strong enough in its sensational or emotional appeal to be presented for such individual comprehension and retention as may result.

Recognition of the importance of some mathematical facts, principles, and processes for the majority of individuals, on the basis of direct and specific values, would justify the organization of a course in mathematics to meet the needs common to most individuals. Such a course would include those, and only those, mathematical facts, principles, and processes which may reasonably be expected to have practical applications in the lives of most people, involving elements of arithmetic, algebra, geometry, and such other mathematics as may be appropriate. Some such course of "composite" or "combined" mathematics might well find its place in the junior high school where it would serve not only to provide useful mathematical knowledges to those who will leave school early and to those who will not further study mathematics, but would also serve as a valuable prognostic factor for those who would later in the senior high school undertake the systematic study of algebra, geometry, or other higher mathematics. Such further mathematical knowledges as may be appropriate to industrial or other vocational courses should be provided in the vocational courses themselves in direct connection with their vocational applications.

213. Indirect values claimed: number and space concepts. Among claims sometimes made for the study of mathematics is the claim that it develops number and space concepts which are fundamental elements in mental life. Thus the National Committee of Fifteen states:[1]

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[1] National Committee of Fifteen, *Final Report on Geometry Syllabus. The Mathematics Teacher*, vol. v, p. 44.

> The study of geometry leads also to an appreciation of the dependence of one geometric magnitude on another, in other words to the tangible concept of *functionality.*
>
> The study of geometry cultivates space intuition and an appreciation of and control over forms existing in the material world, which can be secured from no other topic in the high school curriculum.

Likewise the study of algebra has frequently been urged as a means of extending the concept of number relations to desirable limits beyond the concrete field of arithmetic. Beyond doubt number and space concepts play an important part in the interpretation of all quantitative phenomena. It would be difficult to say, however, whether additions to such concepts as arithmetic has developed are important enough for the majority of individuals to justify any extensive study of algebra or geometry. None but an *a-priori* or empirical answer can be given to this question.

Closely related to the development of number and space relations is the development of "the language of mathematics." Thus Karpinski:[1]

> Equally important is the fact that like the mother-tongue the language of mathematics is employed in the daily life of the child; to formulate this in the language of the psychologist there is a related body of apperceptive material already present in the child consciousness.

The literature of almost all fields of science (in the broadest sense of that term) is replete with "mathematical language," and the "general reader" should have some understanding of it. Again, however, research is necessary to determine how far supra-arithmetical study is necessary for the development of "mathematical language" valuable for the average individual. None but empirical estimates are at present possible.

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[1] Karpinski, L. C., *op. cit.*, p. 133.

214. Mathematics and the transfer of improved efficiency. From the time of its introduction into the program of the secondary school the study of mathematics has been justified by its advocates to a considerable extent on the basis of its values as a means of "mental discipline." With the growing realization of the limitations of its direct values and their contingent character greater and greater emphasis has been placed on the disciplinary values of secondary-school mathematics. Thus Schultze:[1]

> Mathematics is primarily taught on account of the mental training it affords and only secondarily on account of the knowledge of facts it imparts.

Thus also Smith:[2]

> Here, then, is the dominating value of geometry, its value as an exercise in logic, as a means of mental training, as a discipline in the habits of neatness, order, diligence, and above all, of honesty.

Likewise Young:[3]

> But the facts of mathematics, important and valuable as they are, are not the strongest justification for the study of the subject by all pupils. Still more important than the subject matter of mathematics is the fact that it exemplifies most typically, clearly, and simply certain modes of thought which are of the utmost importance to every one.

Since mathematics is a preferential if not a required study in most secondary schools, and since such general study of mathematics cannot be justified on the basis of direct values alone, it is clear that the problem of the possibility, method, and amount of the transfer or spread to non-mathematical fields of improved efficiency gained in and through the study of mathematics is by far the most important problem to be considered in connection with the values of the study of secondary-school mathematics. No theory can justify the prescription of mathematics or any other study for all pupils in the secondary school. On the other hand, if extensive transfer values can be established for that subject, its position as a leading study in the secondary school can be justified. If transfer values are lacking or insignificant, mathematics must cease to occupy a prominent position in most curriculums.

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[1] Schultze, A., *The Teaching of Mathematics in the Secondary School*, p. 29.

[2] Smith, D. E., *The Teaching of Elementary Mathematics*, p. 239.

[3] Young, J. W. A., *The Teaching of Mathematics in the Elementary and the Secondary School*, p. 17.

It cannot be doubted that the study of mathematics affords abundant opportunity for the exercise of numerous valuable mental traits, that its subject-matter is peculiarly adapted to the development of those traits as far as they may be applied to mathematical content, and that the materials of mathematics lend themselves readily to manipulation for whatever purpose desired. The important question is, of course: Can those traits be generalized, divorced from mathematical content, and utilized in their improved efficiency for other content and other situations in life?

Before attempting to answer that question, it is well to consider just what traits are commonly claimed by proponents of mathematical study in the secondary school to afford such improved efficiency. Most prominent among those traits are those involved in reflective thinking (reasoning).[1] This claim has been considered specifically in Chapter XI and little more can be said here. It may, however, be repeated (*a*) that such transfer is possible; (*b*) that the method of transfer depends on the ordinary laws of dissociation; (*c*) that the extent of such transfer depends on the degree in which materials are organized and presented so as to make conditions favorable for dissociation. It may further be repeated that whatever transfer is possible it cannot be expected to operate automatically in all cases but should be aimed at definitely. The amount of actual transfer is conditioned both by the character of subject matter and also by the methods employed.

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[1] Cf. Schultze, A., *op. cit.*, pp. 18–26; Young, J. W. A., *op. cit.*, pp. 17 *ff.*

In addition to the claim made for the transfer of ability in reasoning the many claims commonly made for transfer values include the following:[1] (*a*) development of the "power of concentration"; (*b*) development of the "constructive imagination"; (*c*) growth of "mental self-reliance"; (*d*) development of "character"; (*e*) capacity for "generalizing conceptions"; (*f*) cultivation of "reverence for the truth"; (*g*) cultivating the "habit of self-scrutiny," etc. That these desirable mental traits may be exercised in the study of mathematics is undisputed. The central problem, however, here as elsewhere, is the problem of their transferability, and the validity of the claims that mathematics may foster such general traits must be tested by theories of the method and extent of transfer in general. Here in particular, however, one must be on guard against the conception that separate "faculties" or "powers" of concentration, attention, constructive imagination, etc., exist. For the rest the discussion of the general problem of transfer in Chapter XI must here suffice.

215. Characteristics claimed to favor transfer values. The first condition for the successful transfer of improved efficiency is that the trait which it is desired to transfer be developed in connection with the content of the training study. In the general discussion of transfer values it was suggested that subjects of study differ in the degree in which favorable conditions are afforded for the exercise of the desired trait and that the transfer of improved efficiency is primarily conditioned by the character of the original training material. Secondary-school studies differ in the extent to which desirable mental traits may be exercised, in the fitness of the materials for purposes of manipulation in teaching, and in the character of the materials as already organized for teaching. In these three respects mathematics possesses advantages over many subjects of study. The materials of mathematics, ranging all the way from the simplest to the most complex, may be manipulated almost at will, thus permitting the arrangement of conditions most favorable to dissociation. The organization of materials in the field of mathematics has been determined from the start for purposes of teaching. With regard to the ready manipulation of materials for the purpose of fostering transfer values mathematics shares prominence with the language studies. With regard to the certainty and accuracy of its data it supersedes all other subjects. With regard to the opportunity which it affords for the exercise of valuable mental traits most desirable to transfer, if possible, it is equaled by few and surpassed by none of the other subjects in the program of the secondary school.

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[1] Cf. Schultze, A., *op. cit.*, pp. 26–27; Young, J. W. A., *op. cit.*, pp. 41 *ff.*

216. Rugg's experiment. The majority of investigations designed to determine elements of transfer have dealt with memory or sense and perceptual factors and for the most part under laboratory rather than school conditions. Among the most noteworthy transfer investigations concerned directly with subjects of study and conducted under school (college) conditions is that of Rugg, who attempted to determine the transfer effect of the study of descriptive geometry by college students. The limitations of space permit here only the Summary of Conclusions arrived at by Rugg: [1]

> The study of descriptive geometry (under ordinary classroom conditions throughout a semester of fifteen weeks) in which such

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[1] Rugg, H. O., *The Experimental Determination of Mental Discipline in School Studies*, pp. 114–15, 6. Quoted with the permission of the publishers, Warwick and York.

> natural and not undue consideration is given to practice in geometrical visualization as is necessary for the solution of descriptive geometry problems operates: —
>
> (1) Substantially to increase the students' ability in solving problems requiring the mental manipulation of a geometrica nature, the content of which are distinctly different from the visua content of descriptive geometry itself.
>
> (2) Substantially to increase the students' ability in solving problems requiring the mental manipulation of spacial elements of a slightly geometrical character, i.e., problems utilizing the fundamental elements of geometry (the point, line, and plane), but apart from a geometrical setting, and in such form as to offer no geometrical aids in solution.
>
> (3) Substantially to increase the students' ability in solving problems requiring mental manipulation of spacial elements of a completely non-geometrical nature, i.e., problems in which the straight line and plane do not appear in any way whatsoever.
>
> (4) The training effect of such study in descriptive geometry operates more efficiently in those problems whose visual content more closely resembles that of the training course itself, i.e., in those problems whose imagery content is composed of combinations of points, lines, and planes, and *in which the continuity of the manipulating movements approaches the continuity of those in the training course.*
>
> The possibility of one disciplinary outcome of a specific school subject, i.e., the ability in the mental manipulation of special elements, has been established in this investigation. The experimenter believes that, in general, disciplinary outcomes of school studies will be found in the above-listed agencies of transfer, i.e., the development of concepts of method in analyzing 'problem' situations and organizing methods of procedure, the habitualizing of reaction to specific cues, the development of attitudes of orientation and familiarity with the type of situation to be met, and the extension of the range of attention.

The numerous difficulties which surround the investigator in such a study as that conducted by Rugg prevent us from accepting the conclusions reached otherwise than as suggestive and tentative. Many more investigations in this field must be made before any assured judgment can be reached.

217. Criticism of mathematics as now organized. In the preceding discussion several points have been raised which afford some basis for criticism of the economy of the study of mathematics as at present organized in the American secondary school.

(1) Previously, attention was called to the common fallacy of assuming values for a whole subject on the basis of values which are valid for parts only of that subject. This fallacy is found in the tendency to assign universal values to secondary-school mathematics on the basis of values which are valid for elementary phases of the field (arithmetical material) only. The resultant emphasis on direct values of the study of algebra and geometry is unjustified.

(2) Current teaching of secondary-school mathematics commonly errs in expecting to take place too much transfer of mental traits exercised in the study to non-mathematical fields. It also errs in expecting such transfer as may be hoped for to take place automatically and without proper provision for fostering dissociation. Teachers of mathematics must recognize that there are no general "faculties" such as concentration, attention, memory, reasoning, and the like, which can be developed independently of specific content. The most that can be hoped for is that valuable methods of mental activity may be transferred, that ideals of accuracy, standards of certainty, and the like, may be so established that they will be generalized from a type form and dissociated from mathematical content. Further, they must realize that, while a limited amount of transfer can be secured under almost any conditions, the desired amount of transfer can be secured only when materials and methods of teaching are deliberately adapted to that end and conditions fostering extensive transfer are provided. It is futile and criminal to establish the study of secondary-school mathematics on the basis of extensive transfer values and then to

fail to meet the conditions necessary if any extensive amount of transfer is to be accomplished.

(3) Attempts to emphasize applied mathematics do not meet the conditions favorable to extensive transfer. Valuable though applied mathematics is and important though "real" problems may be, their function is to attain direct values and not to foster conditions favorable for transfer. It is a tenable thesis that for most pupils pure mathematics is superior to applied mathematics because of its greater transfer values. Thus Colvin: [1]

> We may then conclude that pure science is of greater disciplinary value, because (1) through the facts which it presents, ideals of procedure and of truth may be developed which function in a wider human experience, greatly to the uplift of the race; (2) the content and method of pure science is such that it has a broader field of application than has applied science, and can function as an identical or similar element in more situations than can applied science; (3) the emotion which the pure seeking after truth arouses is higher and less likely to be deadened by other emotions than are the ideals of economic improvement and social betterment, which are the ideals of applied science.

It is to be noted here that applied forms of mathematics have their place, and an important place in the program of studies, but that importance attaches to the study of applied mathematics on the basis of its direct values for special groups of pupils.

(4) The fact that justification can be found for the teaching of secondary-school mathematics on the basis of its indirect values and the fact that those values are not limited to special curriculum groups of pupils do not justify any assumption that all pupils should study algebra and geometry. The common requirement of the study of algebra and geometry on the part of all pupils is opposed to the concep-

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[1] Colvin, S. S., *The Learning Process*, pp. 249–50 *et circ.* Quoted with the permission of the publishers, The Macmillan Company.

tion that individual differences in capacities, interests, and future activities must be recognized. This is true whether we accept or reject indirect values.

(5) From whatever angle we approach the problem of the organization of mathematics the present method of isolating arithmetic, algebra, and geometry, and other departments of mathematics raises serious questions. If we approach the problem from the viewpoint of the nature of mathematics as a science, we face the fact that mathematical thought is a complex unit and that the various phases are so interwoven that separation is a tour de force for supposed educational advantage. If we approach it from the viewpoint of the applications of mathematics, we face at once the fact that the various phases are or may be so interrelated that a single application may involve at the same time arithmetic, algebra, and geometry. If we approach the problem from the viewpoint of direct values, we find that the study of arithmetic, algebra, and geometry separately, in sequence, and as completely organized sciences is wasteful of time and energy and little suited to the effective application of direct values. Finally, if we approach the problem from the viewpoint of indirect values, we find that the separation in learning of the various phases of the science is one of the surest ways to lessen conditions favorable for transfer. Current criticism is sound in its insistence on a closer correlation of the departments of mathematics in the schools. It is not so sound when it bases that correlation on direct and applied values alone.

(6) In common with other studies in the secondary school mathematics suffers from its isolation. One of the surest ways in which transfer values may be materialized from the study of mathematics is to see that methods, ideals, and the like, exemplified in its study may also be exemplified in subjects dealing with content material of a different sort and so recognized by the pupil. Any number of examples afforded

must be of relatively little value unless application is made in the fields where the application is desired. Until the teacher of mathematics fully recognizes the fact that the pupil, not the subject, is the unit to be considered and that the mathematical experiences of the pupil constitute but a small part of his total experiences, much of the value of the study of mathematics must be lost. No education can be successful unless the experiences of the individual are unified. The correlation of the work in mathematics with the work in other subjects and with experiences outside the school must be effected if the values of mathematics itself are to be developed.

218. The order and position of mathematical studies. The Committee of Ten recommended the earlier introduction of algebra and geometry, suggesting that certain elements of those subjects be introduced into the work of the later grades of the elementary school. With the development of plans for the reorganization of the school system, particularly in connection with the junior-senior high-school plan, emphasis has been placed on the earlier introduction of some mathematics now commonly restricted to the later grades. Reasons for this change are the following: (1) the study of arithmetic is prolonged beyond desirable bounds in the American schools; (2) a closer correlation between arithmetic, algebra, and geometry is desirable; (3) many boys and girls now leave school before they come into contact with any forms of algebra and geometry; (4) those who continue their education through the high school are delayed in the acquirement of a valuable tool; (5) at present the only opportunity to gain any knowledge of algebra or geometry is that afforded through the study of either in the form of a complete and logically organized science; (6) the change from the familiar field of arithmetic to the higher mathematics is too abrupt.

To ameliorate conditions implied in the reasons given for the earlier introduction of algebra and geometry it has been suggested that a course or courses in "composite" or "combined" mathematics be provided in the junior high school and that logically organized courses in algebra, geometry, and other higher mathematics be reserved for the senior high school. The course in "composite" mathematics in the junior high school would then be organized so as to include those elements of arithmetic, algebra, and geometry which may be considered as of reasonably direct value to the average individual. Not only would such a course provide a diagnostic or prognostic element for later mathematical study and afford instruction in mathematical elements most useful directly to the average person, but it would also provide whatever elements of number and space concepts or of "mathematical language" may legitimately be expected to result from some contact with algebra and geometry. In the senior high school provision could then be made for the systematic study of algebra, geometry, and other mathematics by those mathematically inclined and mathematically capable.

PROBLEMS FOR FURTHER CONSIDERATION

1. Compare the organization of mathematical study in the American schools, in Prussian higher schools, and in the French *lycée*.
2. Examine elementary textbooks in physics and chemistry to ascertain the mathematical facts, principles, and processes necessary for elementary study in those fields. Do the same for more advanced study in those fields.
3. What specific mathematical abilities are required of the machinist, electrician, and similar artisans?
4. What specific mathematical abilities are required of the civil engineer? — of the mechanical engineer? — of the mining engineer?
5. Make a list of the supra-arithmetical facts, principles, and processes of mathematics that appear to be sufficiently applicable to the ordinary affairs of life to warrant their inclusion in a course for average pupils on the basis of their direct and practical values.

6. Examine any textbook in geometry and classify the materials presented accordingly as (*a*) they deal with matters ordinarily accepted as valid on the basis of general experience; (*b*) they deal with facts, principles or processes valuable for their application in science or occupations (*c*) they deal with facts, principles, or processes themselves not important but forming the basis of important facts, principles, or processes.
7. What are the arguments for and against the requirement of the study of algebra on the part of all pupils? — geometry?
8. Trace the historical development of the study of mathematics in the American secondary school.
9. Make a study of college admission requirements in mathematics.
10. What are the arguments for and against the study of algebra by girls? — geometry?
11. Determine the correlation between ability to perform the formal operations in algebra and ability to perform applied problems.
12. Determine the correlation between ability to handle the propositions of geometry and ability to handle "originals."
13. Determine the correlation of ability in arithmetic and ability in algebra; between arithmetic and geometry; between algebra and geometry.
14. Determine the correlation between accuracy in handling algebra and accuracy in copying a page of printed English.

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CHAPTER XV

THE PLACE OF THE NATURAL SCIENCES IN THE PROGRAM OF STUDIES

219. Historical development. Though some beginnings were made in the study of the natural sciences in the secondary school through the sense-realism movement of the seventeenth century, no appreciable study of natural science found a place in the secondary school until the latter part of the eighteenth century, or even until the beginning of the nineteenth century. Its real beginning was found in the development of the *realschule* and academy as a part of the expansion of the curriculum of the secondary school which characterized those movements. In America no natural science was found in the colonial grammar school. From the inception of the academy movement, however, the natural sciences found an increasingly important place in the secondary school. By the beginning of the high-school movement the time was ripe for the introduction of natural science into the program of the public secondary school.

In the first high school established (the Boston English Classical School, opened in 1821) "natural philosophy (physics), including astronomy" was required of all pupils in the last year of the course. By the regulations of 1823–24 natural philosophy was required in the second year of the course in that school and "a course of experimental lectures on the various branches of natural philosophy" in the last year. In addition Blair's *Elements of Arts and Sciences* was prescribed for the first year of the course. In the Girls' High School of Boston (established in 1826) natural philosophy was a prescribed study in the second year of the course, chemistry in the third year, and botany was made an elective study. No natural-science study was required by law in a public high school until the prescription by the law of 1857 in Massachusetts. By this law high schools in that State were required to give instruction in natural philosophy, chemistry, and botany. In addition all high schools in towns of four thousand inhabitants or over were required by that law to provide instruction in astronomy and geology. Such provisions remained in the statutes of Massachusetts until 1898 when all natural-science subjects were made permissive. Interest in the study of the natural sciences developed faster than the public high schools. Thus in 1840 (when there were less than eighteen high schools in the State) 170 towns in Massachusetts claimed to provide instruction in natural philosophy, 58 to provide instruction in astronomy, and 57 to provide instruction in chemistry.

The entrance of natural sciences into the program of studies of the public secondary school was in answer to the interest in and the development of the natural sciences during the first half of the nineteenth century. It must be noted, however, that they were for the most part taught as informational subjects and with little reference to their logical organization as sciences in the technical sense of that term. During the early period laboratory work was all but unknown and little applied work was done except in experiments by the teacher. With the possible exception of requirements for certain courses in such colleges as the Lawrence Scientific School at Harvard, the earliest recognition of a natural science for college entrance was that of physical geography at Harvard and Michigan in 1870. Natural philosophy was first recognized for college entrance at Syracuse University in 1873 and in 1876 entrance examinations were conducted at Harvard in elementary botany, the rudiments of physics, chemistry, and descriptive astronomy. Laboratory work as a part of the study of natural science accepted for admission to college was first inaugurated at Harvard in 1887.

The study of the natural sciences during the second half of the nineteenth century spread to almost all fields, so that, during the last quarter of the century, numerous natural-science subjects were found in different high schools and practices were widely variable. Hence, in 1892–93 the Committee of Ten attempted to organize and standardize the secondary-school work in the natural sciences. For the four years of high-school work in the natural sciences it suggested the following program.

TABLE CXXX *

Subject	Grade	*Number of periods per week and proportion of time recommended*							
		English course		*Latin scientific course*		*Modern language course*		*Classical course*	
		Periods per week	*Per cent of time*	*Periods per week*	*Per cent of time*	*Periods per week*	*Per cent of time*	*Periods per week*	*Per cent of time*
Physical geography	I	3	15.0	3	15.0	3	15.0	3	15.0
Physics	II	3	15.0	3	15.0	3	15.0	3	15.0
Botany or zoölogy	II	3	15.0	3	15.0	3	15.0	0	0.0
Astronomy	III	1.5	7.5	1.5	7.5	1.5	7.5	0	0.0
Meteorology	III	1.5	7.5	1.5	7.5	1.5	7.5	0	0.0
Chemistry	IV	3	15.0	3	15.0	3	15.0	3	15.0
Geology or physiography	IV	1.5	7.5	1.5	7.5	1.5	7.5	0	0.0
Anatomy, physiology, hygiene	IV	1.5	7.5	1.5	7.5	1.5	7.5	0	0.0
Total natural science	I–IV	18	22.5	18	22.5	18	22.5	9	11.3

* Committee of Ten, *Report on Secondary School Studies*, pp. 46–47 (Bureau of Education edition). Compilation and arrangement by the author.

The recommendation of the Committee accomplished much to organize the work in the natural sciences in the secondary school: (1) it tended to standardize the sciences to be studied; (2) it tended to standardize the order in which the sciences should be studied; (3) it gave great impetus to the study of the natural sciences as *sciences* with emphasis on laboratory work; (4) it emphasized the study of some natural science by every pupil. Some results of the recommendations of that committee, however, were not so satisfactory: (1) the committee failed to arrange the work so as to meet the needs of pupils who left school before the close of the course; (2) its recommendations tended to organize the study of the natural sciences in terms of the subjects rather than in terms of the capacities of the pupils and their later needs; (3) it supported the study of several natural sciences which were of questionable value (in a relative sense) in the secondary school and which in later development were discarded, at least as separate subjects of study, e.g., astronomy, geology, meteorology; (4) it failed to recognize the need of relating the study of the natural sciences more directly to life, especially with reference to vocations.

The status of the study of natural sciences from 1890 to 1915 may be noted from the figures presented in Table CXIX and from its accompanying graph illustrating the trend of the secondary school program during those years. From those figures it may be seen that the study of the natural sciences has in some cases noticeably declined within the past quarter-century. It must be remembered, however, that applied forms of the natural sciences, not reported in the table referred to, have markedly increased within that period, e.g., agriculture, general science, etc., thus offsetting largely the decline (real or apparent) in the study of the natural sciences.

On the whole, three periods in the development of the study of the natural science in the secondary school are to be distinguished. During the first period (about 1800 to 1870) the natural sciences were studied and organized largely as informational courses. During the second period (about 1870 to 1900) the tendency was to organize the study of the natural sciences according to the demands of pure science. The third period (about 1900 to the present) has been characterized by attempts to organize the study of natural sciences in part according to their applications. This movement, however, is as yet in its formative stage.

220. Present status. According to the latest returns available (1914–15) the natural sciences are studied in secondary schools to the extent indicated in the following table.

TABLE CXXXI. PUPILS ENGAGED IN NATURAL-SCIENCE STUDIES 1914–15 *

Subjects	*Public schools*		*Private schools*		*All schools*	
Physical geography	169,911	14.58%	19,318	15.37%	189,229	14.66%
Physics	165,854	14.23	18,572	14.78	184,426	14.28
Physiology	110,541	9.48	17,802	14.16	128,343	9.94
Botany	106,520	9.14	11,673	9.29	118,193	9.15
Chemistry	86,031	7.38	12,485	9.93	98,516	7.63
General biology	80,403	6.90	4,936	3.93	85,339	6.61
Zoölogy	37,456	3.21	4,437	3.53	41,893	3.24
Geology	5,558	.48	2,032	1.62	7,590	.59
Astronomy	3,224	.28	2,543	2.02	5,767	.45

* *Report of the United States Commissioner of Education* (1916), vol. II, pp. 487–89.

In the interpretation of these figures it may be noted: (1) that certain sciences once popular (astronomy and geology) have almost disappeared from the programs of the public secondary schools; (2) that the relatively large number of pupils engaged in the study of physical geography is in part explained by the fact that it is commonly taught in the first year of the high school where about forty per cent of all pupils are enrolled; (3) that botany, zoölogy, and physiology are frequently combined in one course of "biology," a fact which in part explains the relatively large numbers of pupils enrolled in those studies; (4) that the relatively large enrollment in physiology is in part explained by the fact that its study is a common form of legal prescription demanded by "temperance" reformers and its teaching or popularity is frequently more apparent than real; (5) general science courses and special forms of applied-science courses are not reported. An increasingly large number of pupils is being enrolled in courses in "general science," agricultural science, domestic science, etc. In so far as there may properly be said to be a usual course covering the four years of high-school work in the natural sciences it appears to be as follows: —

First year: Physical geography or general science;
Second year: Biology, or biological sciences of some sort;
Third year: Physics;
Fourth year: Chemistry.

Rarely more than one unit of science is required of all pupils and the proportion of pupils who study natural science for four full years is almost negligible.

TABLE CXXXII *

	Entire course VI–O I		*Last four years U II–O I*	
	Total periods per week	*Per cent of time*	*Total periods per week*	*Per cent of time*
Gymnasium	18	5.9	8	5.7
Realgymnasium	29	9.4	19	13.3
Oberrealschule	36	11.7	24	16.8

* Cf. Tables LXXXIV–LXXXVII.

In Prussia the study of natural science is required of all pupils throughout the entire course of the higher schools for boys. The amount of time devoted to such study is indicated in Table CXXXII. During the earlier years are studied the biological sciences, corresponding roughly to "nature study." During the latter grades mineralogy, physics, and chemistry are studied.

In French secondary schools for boys are taught zoölogy, botany, geology, physics, chemistry, cosmography, anatomy and physiology, paleontology, hygiene. Not all pupils, however, study all those subjects. The general order of natural-science studies in the French secondary schools for boys may be seen from the following table.

TABLE CXXXIII. PERIODS PER WEEK DEVOTED TO NATURAL SCIENCE IN THE FRENCH SECONDARY SCHOOLS FOR BOYS *

	First cycle				*Second cycle*		
Grades.....	VI	V	IV	III	II	I	P–M
Divisions . . .	A 1	1	1	0	A 0	0	A 7.5–9
	B 2	1	2.5	2.5	B 0	0	B 7.5–9
					C 4.5	5	
					D 4.5	5	

* Cf. Table CIV.

From this table it may be seen that it is possible for many boys to pass through the secondary school in France without any serious study of natural science, since the science offered in the first cycle is largely an informational subject without laboratory work. On the other hand, it is possible for boys to receive intensive instruction in natural science in the second cycle.

221. Values claimed for the natural sciences. Before considering the values claimed for the various natural sciences as subjects of study in the secondary-school program it is well to consider some of the claims made for the study of natural science in general. Probably the most thoroughgoing claims that have ever been made for the values of the study of the natural sciences are those of Spencer: —

> Thus to the question with which we set out — What knowledge is of most worth? — the uniform reply is — Science. This is the verdict on all the counts. For direct self-preservation, or the maintenance of life and health, the all-important knowledge is — Science. For that indirect self-preservation which we call gaining a livelihood, the knowledge of greatest value is — Science. For the due discharge of parental functions, the proper guidance is to be found only in — Science. For that interpretation of national life, past and present, without which the citizen cannot rightly regulate his conduct, the indispensable key is — Science. Alike for the most perfect production and highest enjoyment of art in all its forms, the needful preparation is still — Science. And for purposes of discipline — intellectual, moral, religious — the most efficient study is, once more — Science. The question which at first seemed so perplexed, has become, in the course of our inquiry, comparatively simple. We have not to estimate the degrees of importance of different orders of human activity, and different studies as severally fitting us for them; since we find that the study of science, in its most comprehensive meaning, is the best preparation for all these orders of activity.[1]

According to Spencer not only is science best fitted for an education which is to give a knowledge of facts, but it is also best fitted to develop the mental "faculties" — a conclusion which he reaches by a most naïve course of reasoning.

> Having found what is best for the one end, we have by implication found what is best for the other. We may be quite sure that the acquirement of those acts which are most useful for regulating conduct, involves a mental exercise best fitted for strengthening the faculties. It would be utterly contrary to the economy of Nature, if one kind of culture were needed for the gaining of information and another kind were needed as a mental gymnastic.[2]

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[1] Spencer, H., *Education*, chap. I, pp. 89–90.

[2] *Ibid.*, p. 79.

Yet one thing more must be added to Spencer's worship of "Science":

> Not only for intellectual discipline is Science the best; but also for moral discipline.
>
> The discipline of Science is superior to that of our ordinary education because of the *religious* culture that it gives. It is religious, too, inasmuch as it generates a profound respect for, and an implicit faith in, those uniform laws which underlie all things. By accumulating experiences the man of science acquires a thorough belief in the unchanging relations of phenomena — in the inevitable connection between cause and consequence — in the necessity of good or evil results.[1]

These claims set up by Spencer for the values of the study of the natural sciences are of particular interest because they embody almost all the fallacies commonly employed by over-enthusiastic proponents of the natural sciences. Those fallacies deserve some special consideration.[2]

(1) Spencer employs the term "science" in at least three different senses which he does not always take the trouble to distinguish. At times he uses the term in a generic sense equivalent to all organized knowledge or "scientific method"; at times he uses the term with reference to the natural sciences in general; at times he employs the term referring to a special science, natural, social, or psychological. This confusion (at least for the reader) arises from the fact that for Spencer the social sciences are biological and psychological, and that psychology is but one phase of biology. Hence, without warning he skips lightly from the use of the term in one sense to its use in another. The "word-jingle" fallacy is thus involved.

(2) At many points Spencer's arguments involve a rather thorough-going theory of faculty psychology.

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[1] Spencer, H., *Education*, pp. 84, 85, 87.

[2] Cf. the general discussion of fallacies frequently involved in the analysis of direct values, section 165.

(3) Attention has frequently been called to the fact that Spencer failed to distinguish between subject matter of great importance to the race and to civilization through a limited number of individual specialists and subject-matter valuable directly for all individuals — a failure to distinguish between values of use, consumption, or appreciation, and values of technical knowledge, production, or accomplishment.

222. Spencer's fallacies perpetuated. The weaknesses of Spencer's claims have been pointed out repeatedly and the past decade or two has seen more careful analysis of the values of the natural sciences as subjects of study in the secondary school. Nevertheless writers of recent date have perpetuated certain of his fallacies. For example, the failure to distinguish between the need of scientific knowledges and skills *on the part of some* and the need of those knowledges and skills *on the part of all* is a constant error. Thus Mills:[1]

> What is Chemistry? In what way does chemistry touch the life of the average man? Will a knowledge of chemistry prove of benefit to the ordinary laborer, or farmer, or mechanic, or business man? Such questions have often been asked, and my almost invariable reply to the questioner is, "Name *anything* about you with which chemistry has nothing to do." It makes little difference as to the reply — cloth, paper, glass, wood, brick, the body itself, the food that we eat, and the earth upon which we walk — chemistry teaches of the constitution of these bodies, of the way in which they are made.

Here values of use, consumption, and appreciation must be contrasted sharply with values of accomplishment, production, and technical knowledge. The former are practically universal: the latter are limited and contingent.

A second fallacy is even more subtle and cannot be illustrated by any single quotation. It is found in the tendency by some writers to establish certain relatively universal values in connection with a specific natural science, e.g., physiology, transfer those values to science in the generic sense, and finally to extend those values to other sciences with which they are but indirectly if at all connected. Thus general values established in connection with biological sciences are frequently transferred to material sciences. A somewhat similar fallacy is involved when certain universal values which may be established for specific parts of a science are extended to cover the entire field of that science as organized into a logical whole.

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[1] Mills, J. E., p. 183 of Johnston, C. H. (Editor), *High-School Education.* Quoted with the permission of the publishers, Charles Scribner's Sons.

The third important fallacy commonly involved in claims for the values of the study of natural science is found in dependence to an unjustifiable extent on a theory of transfer, frequently involving an obsolete theory of faculty psychology. In this respect the scientist has sinned even more than the others against whom he has so frequently charged error. So many direct and specifically practical values can be shown for the natural sciences that one would expect to find the advocates of the study of natural science sedulously avoiding the pitfalls which have enticed the advocates of subjects of less practical application. However, such is not the case. Thus of biology, which of all the science subjects least requires support from a theory of transfer values, Pearse says:

> For those who still question the value of biology, it is easy to find answers. From the point of view of mental training, the proper study of living things offers an excellent field for (1) gathering first-hand knowledge, (2) gaining clear ideas, (3) making concrete analyses, (4) using the mind for abstraction and discrimination, (5) seeing resemblances, (6) forming general concepts, and (7) giving logical definitions.
>
> . . . Biology has a special function in training, in that it has for its subject-matter living organisms whose varying and uncertain

> behavior train the judgment of youth better to understand the behavior of men. It certainly exercises the judgment in a different way than do the exact sciences of physics and chemistry.[1]

And Eliot:

> The student of natural science scrutinizes, touches, weighs, measures, analyzes, dissects, and watches things. By these exercises his powers of observation and judgment are trained, and he acquires the precious habit of observing the appearances, transformations, and processes of nature.[2]

Or Bigelow:

> The disciplinary value of the study of zoölogy, as indeed of any other science, is found in that it may contribute to the development of a scientific attitude of mind, by directing various mental processes, such as those involved in scientific observing, classifying facts, exercising judgment and discrimination, and learning to appreciate demonstrated knowledge.[3]

These fallacies must be carefully guarded against in attempting to analyze the values of the study of natural sciences in the secondary school.

223. **Preliminary analysis of the values claimed.** In an analysis of the values claimed for the study of the natural sciences in the secondary school we may consider them under two general heads: (1) those values which are claimed to arise from the direct and specific use of the facts and processes of the natural sciences in everyday life, in various vocations, and in the pursuit of other studies; (2) those values which are claimed to arise indirectly from the study of the natural sciences through the development of scientific concepts or generalized mental functions. Either of these groups of values claimed may again be subdivided. Thus under the head of direct and specific values may be con-

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[1] Pearse, A. S., p. 199 of Johnston, C. H. (Editor), *High-School Education.*

[2] Eliot, C. W., *Educational Reform*, p. 110.

[3] Lloyd, F. E., and Bigelow, M. A., *The Teaching of Biology*, p. 244.

sidered: (*a*) the values of the study of the natural sciences as measured by the directly practical application of their facts, principles, and processes to those affairs of life which are common to all people whatever be their special activities; (*b*) the values of the study of the natural sciences as measured by the directly practical applications of their facts, principles, and processes to special vocations or special phases of certain vocations; (*c*) the values of the study of the natural sciences as measured by the direct applications of their facts, principles, and processes to other studies. Under the head of indirect and general values may be considered: (*a*) those claimed to rise from the development of scientific concepts such as natural law and the like; (*b*) those values claimed to arise from the transfer or spread to other fields of improved efficiency gained in and through the study of natural sciences. In the following sections will be considered *seriatim:*

(1) Direct and specific values: (*a*) universal "practical" values; (*b*) specific vocational values; (*c*) direct propædeutic values.
(2) Indirect and general values: (*a*) conceptual values; (*b*) general transfer values.

224. **Natural science in the affairs of everyday life.** The values of scientific information and skill are so readily recognized in terms of their applications to the affairs of everyday life that one is easily led into one or all of three common fallacies which were outlined at some length in Chapter XI:[1] (1) the fallacy of estimating values of the study of natural science (especially of inorganic science) in terms of the important part played by natural science in modern life and the failure to recognize that the great contributions of science must come to the race through a relatively small number of specialists; (2) the fallacy of failing

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[1] Section 165.

to recognize the difference between values of utilization, consumption, or appreciation and values of technical knowledge, accomplishment, and production; (3) the fallacy of failing to recognize that the same direct values do not attach to any science as a logically organized whole or to all parts of a single science, which properly attach to some parts of that science. The result of employing such fallacies is a failure to distinguish between universal and limited or contingent direct values, with a consequent tendency to overemphasize universal values of a direct character. The discussion of these fallacies in Chapter XI renders unnecessary further consideration here.

When we interpret the direct values of the study of natural sciences in terms of the need of their facts, principles, and processes in the activities of the average individual we find some measure of the relative values of the several natural sciences and of the relative importance of various parts of the special sciences. Thus, doubtless, interpreted in such terms, certain biological sciences (e.g., physiology and hygiene) should be assigned relatively greater direct value than certain inorganic sciences (e.g., physics), since all individuals, being biological organisms, should have some knowledge of biological facts, principles, and processes if health is to be conserved. Likewise, interpreting values in such terms we should not hesitate to recognize that certain facts, principles, and processes of physics or chemistry have far greater direct value than others. From the standpoint of direct values for most people in the affairs of ordinary life the study of natural sciences must be considered in terms of their utilization, consumption, and appreciation. Such values are practically universal but emphasize special elements only in the study of the sciences. For the natural sciences organized into logically constituted wholes no universal direct values can be claimed for most people in the ordinary affairs of life. It is, of course, recognized that for numerous affairs in which different groups of individuals actively participate the contingent values of the study of certain natural sciences are high. This, however, involves the training of special groups rather than all pupils in the secondary school.

225. Direct values for vocations. The direct and specific applications of the facts, principles, and processes of various natural sciences to special vocations are so obvious that they require little more than mention in the present discussion. The extended applications of science to manufacture and agriculture within recent years have placed greater and greater emphasis on the vocational values of the study of natural science in the secondary school. Little need be said here otherwise than to note that we are dealing in this connection with limited values in the sense that they are to be determined with reference to special groups and with contingent values in the sense that they are to be estimated according to the likelihood that various scientific facts, principles, and processes will "function" in the several vocations which secondary-school pupils will enter. In this connection we must remember that the increased application of natural science to manufacture and agriculture has been paralleled by a tendency toward greater specialization of labor, so that, while the applications of natural science in those fields have grown more important and more numerous, a grasp of the facts, principles, and particularly the processes of natural science is demanded by laboratory specialists only. In any industry the specialists furnish the scientific knowledges and skills while the workers in general merely follow standardized directions. This is true to a far greater extent in manufacture than in agriculture where independent workers are more numerous. Even in agriculture, however, — where, it is to be noted, the organic sciences are the more important, — what is needed is largely a scientific intelligence to utilize information supplied by the specialist.

226. Propædeutic values. Direct propædeutic values of the study of natural science are obvious for those who are destined to pursue their scientific studies along advanced lines. This is, of course, particularly true for those who are destined to enter higher forms of technological, agricultural, medical, or other scientific pursuits. Such groups of pupils are relatively small though important. Here, again, the values found must be considered limited and contingent.

227. Conceptual values claimed. For lack of a more convenient term the term "conceptual" is here applied to those values of the study of natural science which are claimed to arise from the development of such broad concepts as the unity of phenomenal nature, the interrelation of natural and social phenomena, natural law, standards of naturalism and super-naturalism of reality and superstition, ideals of order and system in nature, cause and effect relations in the world of nature, biological evolution, etc. Any real understanding of modern life and thought is impossible without some understanding of those comprehensive concepts which have developed for the most part through the study of natural science. It is not to be conceived that the development and use of such concepts are solely the prerogatives of the philosopher or highly trained scientist. In science the instrument was created by which man can be freed from the bondage of superstition. The world has been freed from the shackles of necromancy, alchemy, witchcraft, astrology, animism, and numerous other errors of understanding through a knowledge and use of natural science. It requires, however, but little observation and imagination to recognize that just as serious errors enslave the thought and action of man at the present day and that large numbers of men and women are seriously misled through superstition and appearances. The point has been stated well by De Garmo: [1]

> Let us call to witness the baseless terrors arising from erroneous belief regarding natural causes, the needless famines, diseases, and devastating pestilences that have afflicted mankind, and then the more lamentable perversion of noble human qualities themselves through blind adherence to authority, or by the injection into human affairs of the devils generated by ignorance of natural law, as in witchcraft or in the Spanish inquisition, thus poisoning the mind with the ptomaines of its own diseased thinking.

One must indeed be an optimist not to believe that superstition and ignorance of natural causes play havoc in the thought and action of millions of men and women in civilized society in the present as in the past.

228. Transfer values claimed. Advocates of the study of natural science, as proponents of other studies in the secondary school, have constantly emphasized its transfer values. In many cases it is held that by the study of natural science such assumed general powers, capacities, or faculties of the mind as observation, discrimination, accuracy, memory, imagination, reasoning, may be so trained as to function with improved efficiency in non-scientific fields. In so far as such claims involve (as they sometimes do) a theory of faculty psychology they must be ruled out of court at once on the ground that modern psychology recognizes no such general and independent faculties as memory, observation, etc. However, the abandonment of such a theory does not mean that certain forms of efficiency developed in and through the study of natural science cannot have effect on fields of study and situations of a non-scientific character. Recent attempts to analyze the transfer values claimed for the study of natural science have to some extent avoided the fallacies prominent in earlier analyses.[1]

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[1] De Garmo, C., *Principles of Secondary Education: The Studies*, p. 55. Cf. White, A. D., *The Warfare of Science and Theology*.

The fundamental problems involved in the transfer values of the study of natural science are the same as those involved in the transfer values of other studies, particularly in mathematics. They have already been considered at some length in Chapter XI. The conclusions there reached were: (*a*) that the transfer or spread of improved efficiency is possible; (*b*) that the method of transfer depends on the ordinary laws of dissociation; (*c*) that the extent of such transfer depends on the degree in which materials are organized and presented so as to make conditions favorable for dissociation. Keeping these conclusions in mind we may consider their application to the question of transfer values in the case of natural-science study.

No one can question that valuable mental traits (employing that term in the generic sense) are exercised and developed by the study of natural science. No one can doubt that mental traits of the same generic quality are employed extensively in non-scientific situations in life. Ideals and habits of accuracy, achievement, proof, persistency, openmindedness, honesty, and the like, are very real common factors in the field of natural science and in other fields: methods of problem solving, "scientific method," etc., are common elements exemplified in connection with data of all sorts: the same human mind with its capacity for generalization is a common element in all intellectual enterprises. The materials and means for transfer are provided in the study of natural science.

Subjects of study differ widely in the degree in which they lend themselves to organization and manipulation for purposes of fostering conditions favorable to the processes of dissociation. Among those subjects whose materials may readily be manipulated for this purpose the natural sciences occupy a prominent position along with mathematics. The degree of transfer values to be achieved through the study of natural science must depend on the organization of materials and the methods employed. When a science is organized and taught with emphasis on direct values alone or primarily the minimum of transfer values is to be expected. Transfer values are always potential and their achievement is not always automatic. The maximum of transfer values will be achieved when the materials are organized for that purpose and the methods of presentation purposely adapted to the development of those values. Direct values and indirect values cannot both be at their maximum at the same time and with the same organization of teaching materials and methods.

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[1] For example, Twiss, G. R., pp. 453–59 of Monroe, P. (Editor), *The Principles of Secondary Education;* Mann, C. R., *The Teaching of Physics,* pp. 171–96.

The most important element of transfer values commonly claimed for the study of natural science comprises that methodology in intellectual enterprises which goes under the name of "scientific method." This, according to Pearson, is marked by (1) careful and accurate classification of facts and observation of their correlation and sequence; (2) the discovery of scientific laws by aid of the creative imagination; (3) self-criticism and the final touchstone of equal validity for all normally constituted minds.[1]

> The scientific method of examining facts is not peculiar to one class of phenomena and to one class of workers; it is applicable to social as well as to physical problems, and we must carefully guard ourselves against supposing that the scientific frame of mind is a peculiarity of the professional scientist. Now this frame of mind seems to me an essential of good citizenship, and of the several ways in which it can be acquired few surpass the careful study of

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[1] Pearson, K., *The Grammar of Science*, p. 37.

some one branch of natural science. The insight into method and the habit of dispassionate investigation which follow from acquaintance with the scientific classification of even some small range of natural facts, give the mind an invaluable power of dealing with other facts as the occasion arises.[1]

229. The values and aims of "general science." Until recent years the only provision for science instruction in the secondary school was provision for a number of isolated unit courses in physics, chemistry, physiology, botany, and the like. Each of those courses was organized on the basis of the logical relations demanded by the subject-matter of the special science involved without reference to the psychological needs of the learner or the situations in which he would apply the knowledges and skills acquired in its study. Recently, however, there has developed the practice of providing a course in "general" or "elementary" science. Several considerations have led to the development of such a course. Among these the most important are the following:

(1) There is need for a course in natural science which is elementary and introductory. The study of natural science in the school differs from some of the studies with which it is grouped in the secondary school in that its development in various fields has led to more or less isolated studies which have no elementary or introductory study as compared with mathematics, the language studies, or even the social studies. There are elementary or introductory courses in botany, physical geography, physics, biology, and chemistry, but no real introductory course in natural science which may serve either to give a general view of natural phenomena or as a diagnostic factor for later scientific study.

(2) The present organization of natural-science studies makes it practically impossible for the pupil to come into any contact with certain fields of science unless he remains

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[1] Pearson, K., *The Grammar of Science*, pp. 6–7.

in school throughout the course. The pupil who leaves school at the close of the elementary school as at present organized has opportunity to come into contact with such elements of nature study and physiology only as are provided in the elementary school. The pupil who leaves school before the last two years of high-school work cannot under ordinary circumstances come into any contact with physics and chemistry. Further, the pupil who remains in school throughout the secondary course has no opportunity to study physics or chemistry except as an intensive subject. It is a case of all or nothing in any field of natural science.

(3) In earlier days the natural sciences were taught in the secondary school largely as informational subjects so that the pupil was provided an opportunity to learn something concerning natural phenomena without elaborate technical work in the laboratory. Beyond doubt certain values of the study of natural sciences were greatly increased by the introduction of laboratory work. The change was not, however, an unconditioned gain, as may be observed from the diminished interest in the study of physics and chemistry since instruction in those sciences was made to involve laboratory work by pupils in the secondary school. The informational courses previously provided were very attractive to secondary-school pupils. The laboratory courses now provided have proved unattractive.[1] Two remedies suggest themselves. (*a*) A course in general science not overburdened by insistence on technical laboratory work may provide science study for those who will not become specialists and for some may awaken such an interest in science study as to lead to more intensive study in later science courses. (*b*) It is a tenable thesis that better results for the total pupil body would be secured if the courses in physics

[1] Cf. Table CXIX and Snedden, D., *Problems of Secondary Education*, p. 231.

and chemistry were so organized that laboratory work be provided for those needing that work for extended study or college admission and for those sufficiently interested in that side of science work, but also that pupils be allowed to study physics and chemistry without necessarily engaging in laboratory work, at least to the extent at present required.

(4) There is need for a course in natural science not restricted in its scope to a single field organized as a logical and exclusive unit, but touching many fields at those points where an acquaintance with the phenomena of nature is valuable directly to the individual. In a preceding section it was pointed out that the direct values of the study of the natural sciences, particularly of the inorganic sciences, as logically organized wholes are limited and contingent. While this is true of those sciences as units it does not hold true of certain facts, principles, and processes which form parts of the several sciences. Some of the facts, principles, and processes of the various natural sciences are valuable for practically all pupils directly. It is an essential principle underlying the organization of a course in general science that the inclusion and organization of the subject-matter shall be determined (*a*) by the demands of the learning process peculiar to pupils of the appropriate stage of development, (*b*) by the importance of the various facts, principles, and processes of the several sciences to the average individual in the ordinary activities of life as engaged in by all.

If the needs implied in the above are to be realized it is clear that the course or courses in general science should be begun rather early in the secondary school, preceded by some contact with the phenomena of nature in the elementary school. In all probability the proper place for courses in general science is in the junior high school. In the senior high school may then follow such intensive courses in such special fields as biology, physics, and chemistry, organized as logical wholes. A course in general science properly organized in the junior high school should lead some pupils to greater interest in the natural sciences in the senior high school.

230. The aims of natural science instruction. The aims of instruction in natural science in the secondary school should be the development of values previously outlined. In specific terms they may be considered in the following:

(*1*) *General science:* The aims of instruction in general science are to provide opportunity for acquaintance by the pupils with the facts, principles, and processes of natural phenomena in such a way as to furnish them with some means of understanding the elementary laws of nature which are necessary for healthy, intelligent, and efficient living. At some length the guiding principles have been well stated by Snedden:[1]

> 1. The primary purpose of general science instruction for youths from twelve to sixteen years of age should be to elucidate, to explain, and to interpret, in degree appropriate to the youth and modest demands of these learners, and by means of genuine and vivid experience, the important facts and simple principles of accessible natural phenomena and of significant and easily comprehended applications of science to human well-being.
> 2. Secondary purposes, which are to be definitely subordinated in teaching processes, and to be realized, if at all, only as by-products, are: (*a*) The intellectual grasp of underlying principles and laws; (*b*) the mastery, as working ideal and specific habit (as opposed to appreciation and intellectual comprehension) of any department of scientific method; and (*c*) the mastery for use in a practical or vocational sense (as distinguished from development of appreciation) of scientific knowledge or technique.
> 3. The *scope* or *range* of natural phenomena and cases of applied science to be included in a program of general science instruc-

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[1] Snedden, D., *Problems of Secondary Education*, pp. 255–62.

tion should be great — theoretically as great as all the available resources of human knowledge, and limited only by the capacity of the learner and the accessibility of the materials.

4. The *whole program* of general science instruction must be very extensive, to the end that from the standpoint of any one school or teacher or grade or pupil it may be almost indefinitely flexible.
5. . . . in the present state of educational knowledge it is unwise, harmful, and even impertinent for educational theorists to delimit particular divisions of general science, or principles or topics therein, as being of relatively superior importance.
6. It is indispensable, once the aims of general science teaching are acceptably formulated, that the wealth of materials available should be organized into suitable *teaching units*, each unit presupposing a fair assignment of time, method of attack, and result to be mastered.
7. Qualitatively, instruction in general science must not aim at exhaustiveness of knowledge, mastery of abstract principle or formula, capacity for detailed expression, or power to make definite application.

(2) *Other sciences:* The special natural sciences provided in the senior high school should aim at intensive study of those subjects as logically organized studies by those pupils only who manifest special interest, special ability, or vocational need. The specific aims must be determined by the values previously considered.

PROBLEMS FOR FURTHER CONSIDERATION

1. Analyze the activities of the home which call for natural-science knowledge and analyze the knowledges called for.
2. Analyze the knowledge of natural science valuable for the skilled worker in metal industries.
3. What knowledge of natural science is of value to the carpenter?
4. What knowledge of electricity is necessary for the average man or woman? — for the average factory worker? — for a man engaged in electric wiring, etc.?
5. What knowledge of chemistry is suitable for the ordinary farmer? — for the housekeeper? — for the pharmacist?

6. What are the arguments for and against providing a course in chemistry or physics without laboratory work, assuming that laboratory work is still provided for special groups of pupils?
7. Outline arguments for and against an introductory course in "general" science to be taken by all pupils.
8. Examine and criticize claims made by various writers for the study of any given natural science in the secondary school.
9. In any secondary-school textbook in chemistry analyze the relative importance attached to various phases of the subject. How would you rearrange and reapportion the material for a class of pupils who will not study chemistry further? Do the same for physics or biology.
10. Make a list of scientific concepts which you believe every secondary-school graduate should have acquired.
11. Outline definitely transfer values which you believe may be found in the study of any given natural science.
12. Criticize Spencer's arguments for the values of the study of science. (Cf. Spencer, H., *Education*, chapter I.)
13. Criticize Huxley's discussion of the values of science study. (Cf. Huxley, T., *Science and Education*, chaps. IV–VI.)
14. In any high school make a study of the amount of natural science study engaged in by members of several "classes" in their high-school courses.
15. For any college make a study of the units of natural science study presented by candidates for admission to college.
16. Compare the relative values of "pure" and "applied" science.

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CHAPTER XVI

THE PLACE OF SOCIAL SCIENCES IN THE PROGRAM OF STUDIES

231. Historical position in the program. While much ancient history, chronology, geography, and mythology was doubtless taught in connection with the classical study of the Latin grammar school, no social science as such was studied in America until the beginning of the academy movement. In the middle of the eighteenth century Franklin recommended the extensive study of history and geography in the academy which he proposed and which was founded at that time. By the beginning of the nineteenth century those studies had attained some prominence in the academies and by the beginning of the high-school movement in the third decade of the nineteenth century history and geography had attained a permanent position in the program of the American secondary school.

By the Massachusetts law of 1827, which marked the real beginning of the public high school, geography was prescribed for elementary schools, United States history for all high schools, and "history" (other than that of the United States) for all high schools in larger cities. Stimulated by the academy movement and by such influences as the Massachusetts law above mentioned the study of geography and history developed even more rapidly than the public high schools themselves. Thus, in Massachusetts, where there were not more than a dozen high schools at the time, out of 294 towns reporting in 1837 to the State Department, 209 towns claimed to offer United States history in their schools and 94 towns claimed to offer other forms of history.

Likewise in 1838–39 "political science" was a subject claimed to be offered in 29 towns. In 1842 Horace Mann reported that 10,177 pupils in Massachusetts were engaged in the study of United States history and 2571 were engaged in the study of "general history." Equally noticeable was the development of courses in history in the academies of New York State.[1]

By the beginning of the second half of the nineteenth century the study of geography had been relegated for the most part to the elementary school, the study of history in many forms had found a permanent place in the program of the public high school, colleges had begun to prescribe history as a requirement for admission (Harvard and Michigan in 1847), and in some high schools "political science" or "political economy" had appeared in the program, "political philosophy" having appeared in the program of the Boston English Classical (High) School in 1821. During the latter half of the nineteenth century the study of history, and to a much less extent of other social sciences, continued to develop. The development of the social sciences in the secondary school from 1890 to the present has already been indicated in Table CXIX.

In 1893 the Committee of Ten on Secondary School Studies recommended the study of history for all pupils during the first year of high-school work and at other points in the course, the time being distributed as shown in Table CXXXIV.

Such an assignment of time and arrangement of courses did not, however, meet the recommendations of the subcommittee on "history, civil government, and political economy," which provided for an eight-year or a six-year course in social studies as in Table CXXXV.

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[1] Russell, W. F., "The Entrance of History into the Curriculum of the Secondary School," *The History Teacher's Magazine*, vol. v, pp. 313 *ff*.

TABLE CXXXIV *

	High-school grade	*Classical course*	*Latin-scientific course*	*Modern language course*	*English course*
Number of Periods per week	I	4	4	4	4
	II	3	0	0	3
	III	0	2	2	3
	IV	3 (elective)	3 (elective)	3 (elective)	3
Total		7 or 10	6 or 9	6 or 9	13
Per cent total time		8.4 or 12.5	7.5 or 11.3	7.5 or 11.3	16.25

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* Committee of Ten, *Report on Secondary School Studies* (Bureau of Education edition), pp. 46–47.

TABLE CXXXV *

Grade	*Eight-year course*	*Six-year course*
5	Biography and mythology.	. . . .
6	Biography and mythology.	. . . .
7	American history and elements of civil government.	Biography and mythology.
8	Greek and Roman history with their Oriental connections.	Biography and mythology.
I	French history. (To be so taught as to elucidate the general movement of mediæval and modern history.)	American history, and civil government.
II	English history. (To be so taught as to elucidate the general movement of mediæval and modern history.)	Greek and Roman history, with their Oriental connections.
III	American history.	English history. (To be so taught as to elucidate the general movement of mediæval and modern history.)
IV	A special period, studied in an intensive manner; and civil government.	American history and civil government.

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* Committee of Ten, *Report on Secondary School Studies* (Bureau of Education edition), pp. 163–64.

The same sub-committee recommended:[1]

> That formal instruction in political economy be omitted from the school program; but that economic subjects be treated in connection with other pertinent subjects. . . . That to American history in the first group of studies be added the elements of civil government.

Neither the report of the Committee of Ten nor the report of its sub-committee on the social sciences succeeded in creating a desirable amount of order out of the chaos which had previously existed in the study of the social sciences: hence in 1896 a committee was appointed by the American Historical Association "to consider the subject of history in the secondary schools and to draw up a scheme of college entrance requirements in history." That committee made a survey of the current practices in the teaching of history in about 260 representative secondary schools in the country. It reported in 1898:

> The subjects in the order of their frequency are: (1) English and American history, taught in more than half the schools; (2) "General history," taught in almost exactly half the schools; (3) Greek and Roman history, taught in about half the schools; (4) European history taught in about one third of the schools, the three forms — mediæval, modern, and French history — being about equally common. In a very few schools the history of the state in which they are situated is a subject. The favorite topics are, therefore, English and American history, usually both taught in the same school; Greek and Roman history, usually both taught in the same school; and some form of what is commonly called "general history."[2]
>
> . . . In general four different systems (of the order of subjects) have been followed: (1) About one third of the schools follow the

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[1] Committee of Ten, *Report on Secondary School Studies* (Bureau of Education), pp. 162–63.

[2] Committee of Seven, *The Study of History in Schools* (The Macmillan Company print), p. 139.

> chronological method, taking up in succession ancient history, general history, and modern history in some form, usually English or American or both; . . . (2) A much smaller number of schools, perhaps a seventh of the whole, prefer the order — general, ancient, and modern; . . . (3) The third method begins with American, or sometimes with English history, and then takes general history, bringing in ancient history last. About one fifth of the schools reporting use this system; . . . (4) A fourth method, which prevails in more than a quarter of the schools, is that of beginning with American history, following with ancient history and ending with a general course; . . . To make the generalization in broader form: the returns from a body of schools most interested in the subject of history show that one half prefer to begin high-school work with the history nearest to the pupils in experience, and then to take up wider choices, while one third have the chronological system, and the remainder begin with the general survey of the field.[1]

The same committee recommended a four-years' high-school course as follows:[2]

> As a thorough and systematic course of study, we recommend four years of work, beginning with ancient history and ending with American history. For these four years we propose the division of the general field into four blocks or periods, and recommend that they be studied in the order in which they are here set down, which in large measure accords with the natural order of events, and shows the sequence of historical facts.
>
> (1) Ancient history, with special reference to Greek and Roman history, but including also a short introductory study of the more ancient nations. This period should also embrace the early Middle Ages, and should close with the establishment of the Holy Roman Empire (800) or with the death of Charlemagne (814), or with the treaty of Verdun (843).
>
> (2) Mediæval and modern European history, from the close of the first period to the present time.
>
> (3) English history.
>
> (4) American history and civil government.

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[1] Committee of Seven. *The Study of History in Schools* (The Macmillan Company print), pp. 140–41.

[2] *Ibid.*, pp. 34–35.

The report of this committee had a marked effect on the teaching of history in the high school, an effect which is still strongly felt. However, the Committee of Five on the Study of History in Secondary Schools suggested certain changes among which the most important were:[1] (1) the requirement of three years of study in history by every pupil; (2) changes in the content of the various "blocks"; (3) greater emphasis on modern history; (4) more attention for civil government; (5) a revision of the four blocks as to the order of their study, suggesting the order — (A) Ancient history, (B) English history, (C) modern European history, (D) American history and government. The effect of the reports of the two committees (Committee of Seven and Committee of Five) on present-day conditions may be observed in Table CXXXVII.

It may be noted in the reports of the Committee of Ten, the Committee of Seven, and the Committee of Five that social studies other than history were almost neglected. Throughout the history of the high school the study of civics has had a rather precarious existence, commonly being found in the form of civil government confined to somewhat formal study of governmental agencies and taught as an appendage to the study of American history. It is only within the past decade or so that the study of civics has begun to come to its own in the program of studies in the high school. Even more precarious has been the position of the study of economics in the high school as may be seen from Table CXXXVII.

232. Present status. In 1914 the Bureau of Education attempted to ascertain the status of the social sciences in secondary schools. Returns were received from 62.5 per cent of all the secondary schools in the United States. While the data received were not altogether satisfactory they give a fair idea of the situation as it was at that time. From the returns it was estimated that thirty per cent of the schools reporting required for graduation all of the history they offered and thirteen per cent made history entirely an elective. Also the returns indicated that between 1910 and 1914 forty-three per cent of the schools reporting increased their offerings, 11.5 per cent decreased their offerings, and the other schools reporting made no change in the amount offered. The figures presented in the following table will give a fair idea of conditions in 1914.

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[1] Report of the Committee of Five, *The Study of History in Secondary Schools*, especially pp. 65, 24 *ff.*, 53 *ff.*, 9–11, 64. Committee appointed in 1907: its report published in 1911.

TABLE CXXXVI. NUMBER AND PER CENT OF THE SCHOOLS WHICH REPORTED OFFERING SEVERAL AMOUNTS OF HISTORY REQUIRED AND ELECTIVE *

Number of hours	*Required*		*Elective*	
	Number	*Per cent*	*Number*	*Per cent*
None	312	7.0	2,189	40.8
36–88 hours	234	5.2	185	3.4
108–176 hours	396	8.8	316	5.9
180–264 hours	1,042	23.2	639	11.9
288–528 hours	1,679	37.4	805	15.0
540–704 hours	674	15.0	724	13.6
720–880 hours	136	3.0	391	7.3
More than 880 hours	16	.4	118	2.2
Totals	4,489	100.0	5,367	100.1

Median amount of time for required history . . . 288–528 hours or between 1.6 and 2.9 "units."

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* Table compiled from data given by Briggs, T. H., in *Report of the United States Commissioner of Education* (1915), vol. II, p. 120. Certain of Briggs's percentages required correction.

Even more illustrative of the place at present held by the social sciences are the figures presented in Table CXXXVII.

TABLE CXXXVII. NUMBER OF SCHOOLS OFFERING REQUIRED AND ELECTIVE HISTORY OF VARIOUS KINDS IN EACH HIGH SCHOOL GRADE *

	I		*II*		*III*		*IV*		*I–IV*		*Grand total*
	Req.	*Elec.*	*Req.*	*Elec.*	*Req.*	*Elec.*	*Req.*	*Elec.*	*Req.*	*Elec.*	
Ancient history	*2049*	*1324*	1588	874	158	123	29	26	3494	2347	6141
Mediæval and modern European history	195	97	*1818*	*1401*	1000	1059	70	105	3083	2662	5745
English history	337	191	332	358	*1157*	*1749*	133	268	1959	2666	4625
American history	121	58	114	51	730	360	*3376*	*1391*	4341	1860	6201
Industrial history	22	77	23	103	30	*138*	36	*202*	113	520	633
Civics	*589*	*242*	230	139	641	465	*2397*	*1573*	3857	2419	6276
Economics	11	11	37	60	140	469	*310*	*1026*	498	1566	2064
General history	48	9	179	17	45	12	7	9	279	47	326
Totals	3372	2009	4291	3003	3901	4375	6360	4600	17924	14087	32011

Number of schools reporting	7197
Average number of courses required	2.5
Average number of courses elective	2+
Number of schools requiring all history offered	2172
Number of schools offering only elective history	963
Number of schools offering no history	10

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* Table compiled from data given by Briggs, T. H., in *Report of the United States Commissioner of Education* (1915), vol. II, p. 121.

From this table a number of facts concerning the status of the social sciences in the secondary school may be noted: (1) The influence of the recommendations of the Committee of Seven is noticeable in the order in which the four "blocks" of history are studied, i.e., ancient history in the first year (required in seventy-four per cent of schools where any history is required in the first year), mediæval and modern European history in the second year (required in forty-five per cent of schools requiring any history in the second year), English history in the third year (required in thirty-seven per cent of the schools where any history is required in the third year), and American history in the fourth year (required in ninety-five per cent of schools where any history is required in the fourth year); (2) "general history" has apparently all but disappeared from the program; (3) history in some form is required in the first year of 38.5 per cent of the schools reporting, in the second year of 55.9 per cent of the schools, in the third year of 43.4 per cent, and in the fourth year of 49.4 per cent; (4) it is probable that civics is prescribed either in connection with American history or as a separate subject in more than one half the schools reporting and is offered as an elective subject in another third; (5) civics is taught as a prescribed subject in the fourth year of one third of the schools reporting and as an elective subject in the fourth year by about one quarter or one fifth of those schools; (6) economics has begun to find a place in the program of the secondary school, commonly in the fourth year.

Current theory and practice in the study of civics deserves special attention at the present time. The Committee of Seven recommended that the study of "civil government" be made a separate subject of study in the fourth year of the high school wherever time permitted, and that where time did not permit "civil government" be taught in connection with American history. The latter method was generally adopted and the study of civics commonly was restricted to constitutional law and the machinery of National and State government. Within recent years considerable dissatisfaction has been manifest with the tendency to teach civics as an appendage to American history, to delay its study to the last part of the school course, and to restrict its content to the larger affairs of National and State government. Consequently a strong movement has begun to introduce a new kind of civics which should be studied earlier in the course as a separate subject, which should find the main points of emphasis in the affairs of community life, and have a firmer basis of immediate interest for the pupil. "Community civics" has, therefore, received more and more emphasis in the secondary-school program within the past few years and bids fair to establish itself. Its function and character will be considered in a later section.

If we compare the position of the social sciences in the programs of the American and European secondary schools, noteworthy differences are at once evident. Thus in the French secondary school for boys the study of geography and history (for the most part combined) is found in every grade, from the infant class to the philosophical-mathematical form, and is required of every pupil throughout the course, approximately one seventh of the total time of the entire course being devoted to such studies and approximately the same proportion of time being devoted to such studies in the last four grades. Morals and civics are taught in connection with history in the earlier grades and as a special subject one hour per week in the last two grades of the first cycle.

In the Prussian higher schools for boys social studies begin with geography in the lower grades, that subject being combined with history later. History is begun with stories in connection with the study of the mother tongue, appearing as a separate subject in *Quarta* (age about 11), and continuing throughout the course as a required subject for all pupils. In the entire course from one eighth to one tenth of the total time is devoted to the study of history and geography, that proportion holding also for the last four grades of the course. Religion is required of all pupils two or three periods per week throughout the course. This, of course, functions in many ways as a social study.

In French and in German education it may be noted:

(1) that the study of history forms an important part of the secondary-school program throughout the course; (2) that the study of history is prescribed for every pupil; (3) that in Germany "religion" and in France "la morale" is studied as a separate subject; (4) that the social sciences given are closely correlated; (5) that a large part of the social studies is uniform for all secondary-school pupils.

233. **Character and ultimate aims.** While the several social sciences differ in their character and in their specific aims as studies in the secondary school, it is worth while to consider the general character and ultimate aims of the social sciences as a unit before attempting the separate analysis of the various subjects belonging to the general field. In the Report of the Committee on Social Studies of the Commission on the Reorganization of Secondary Education social studies are defined and their aims set as follows: [1]

> 1. *Definition of the social studies.* — The social studies are understood to be those whose subject matter relates directly to the organization and development of human society, and to man as a member of social groups.
>
> 2. *Aims of the social studies.*—The social studies differ from other studies by reason of their social content rather than in social aim; for the keynote of modern education is "social efficiency," and instruction in all subjects should contribute to this end. Yet, from the nature of their content, the social studies afford peculiar opportunities for the training of the individual as a member of society. Whatever their value from the point of view of personal culture, unless they contribute directly to the cultivation of social efficiency on the part of the pupil they fail in their most important function. They should accomplish this end through the development of an appreciation of the nature and laws of social life, a sense of the responsibility of the individual as a member of social groups, and the intelligence and the will to participate effectively in the promotion of the social well-being.

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[1] *The Social Studies in Secondary Education*, National Education Association, Report of the Committee on Social Studies of the Commission on the Reorganization of Secondary Education, Bureau of Education Bulletin (1916), no. 28, p. 9.

In this statement of the committee a number of important facts are to be noted: (1) the conception that all the social studies may be considered from many points of view as constituting a group of studies, each differing more or less from every other, yet all with important common elements involving a common end — the development of social efficiency; (2) emphasis is placed on the direct values of the studies involved; (3) the specific ends to be aimed at in attaining social efficiency are (*a*) knowledge and appreciation of the nature and laws of social life, (*b*) the development of a sense of responsibility in the individual as a member of social groups, (*c*) the development of the intelligence and habits which may lead to effective participation in social activities.

The recommendations of this committee noticeably involve the conception that the social studies of the secondary school should be organized and taught with reference to the activities of modern life in which the individual will engage. This is seen from the importance attached to modern history and from the important position assigned to civics and related studies. (Table CXXXVIII.)

234. **Values of the study of history.** History as a subject of study in the secondary school has passed through three fairly definite stages and entered on its fourth stage. During the earliest period history was studied primarily as ancillary to the study of the classics. That stage was followed by a second period when history was studied largely as an informational subject. Later still history was studied with emphasis on its supposed disciplinary values. Finally history is now studied with particular emphasis on its sociological values with special reference to the activities of present-day life as participated in by the ordinary man or woman. The relative emphasis given in any one period to certain values does not negate the existence of other values. Hence,

TABLE CXXXVIII*

Seventh year:
(1) Geography — ½ year.
European history — ½ year.
These two courses may be taught in sequence, or parallel through the year.
Civics — taught as a phase of the above and other subjects, or segregated in one or two periods a week, or both.
or (2) European history — 1 year.
Geography — taught incidentally to, and as a factor in, the history.
Civics — taught as a phase of the above and other subjects, or segregated in one or two periods a week, or both.

Eighth year:
American history — ½ year.
Civics — ½ year.
These two courses may be taught in sequence, or parallel through the year.

Ninth year:
(1) Civics: Continuing the civics of the preceding year, but with more emphasis upon State, national, and world aspects — ½ year.
Civics: Economic and vocational aspects — ½ year.
History: Much use made of history in relation to the topics of the above courses.
or (2) Civics — economic and vocational.
Economic History.
1 year, in sequence or parallel.

Tenth to twelfth years:
I. *European history to approximately the end of the seventeenth century* — 1 year. This would include ancient and oriental civilization, English history to the end of the period mentioned, and the period of American colonization.
II. *European history (including English history) since approximately the end of the seventeenth century* — 1 (or ½) year.
III. *American history since the seventeenth century* — 1 (or ½) year.
IV. *Problems of American Democracy* — 1 (or ½) year.

* Committee on Social Studies, *op. cit.*, pp, 15, 35.

before attempting any detailed analysis of the values of the study of history, it is well to make a preliminary classification of the various values claimed.

Here, as in the case of many other subjects of study we may classify the values claimed in two comprehensive groups: (I) direct and specific values; (II) indirect and general values. These comprehensive groups of values may again be sub-divided. Thus under the head of direct and specific values may be considered: (1) direct social-civic values; (2) direct vocational values; (3) direct avocational values; (4) direct propædeutic values. Under the head of indirect and general values may be considered: (1) values of the study of history for the development of certain general social concepts; (2) values of the study claimed to arise from the training of certain valuable mental traits and their transference to non-historical material. In the following sections will be considered *seriatim:*

I. Direct and specific values:
    (1) Direct social-civic values;
    (2) Direct vocational values;
    (3) Direct avocational values;
    (4) Direct propædeutic values.
II. Indirect and general values:
    (1) Conceptual values;
    (2) Transfer values.

235. **Direct social-civic values.** History must always be conceived as one of the principal subjects of study operating toward the attainment of the social-civic aim of secondary education. In common with the other social sciences it deals directly with social phenomena as its content. It differs from the other social studies (except as they may assume an historical aspect) in that: (1) it deals with the phenomena of human activity in their actual processes, dynamic and genetic; (2) its field is more extensive and permits the contact with widely variant conditions; (3) it makes possible the understanding of existing conditions which cannot be appreciated except in terms of the past; (4) it allows opportunity to interpret cause and effect in human action where that relation cannot be seen except with the passage of time; (5) its study offers one of the few opportunities afforded in the secondary school to gain an understanding of other countries and other peoples.

To conceive that the direct social-civic values of history are to be measured solely by the extent to which one may consciously employ certain facts or pieces of information concerning an historical event in solving a problem of the present is to have a very superficial view of the function of historical study. The direct application of a *knowledge* of historical events to present-day problems is, of course, a very real result of the study of history. Much more important, however, than acquired *knowledges* in the field of history are the less tangible but none the less real *attitudes* developed through the study of that subject. One may have but the haziest remembrance of facts concerning the development of the American democracy after a study of American history, but one cannot help having a changed attitude as the result of such study. The secondary-school pupil may forget every date and name in English history after a year's study, but he can never again have the same attitude toward the English nation or any other nation that he had before he studied that subject. No greater mistake could be made in estimating the direct values of the study of history than to assume that such values are to be measured solely by the specific application to modern life of the *knowledges* acquired in such study.

For convenience we may consider the direct social-civic values of the study of history (1) with reference to the more personal activities of the individual, (2) with reference to those activities of the individual which more directly affect united social action, and (3) with reference to social integration.

(*1*) *The personal conduct of the individual:* The individual's character and conduct is determined in part by the forces of heredity and in part by his experiences in his environment. By far the most important part of his environment (from the viewpoint of formal education) is his social environment. The individual is affected, however, by those parts only of his environment with which his experiences bring him into contact. His direct experiences must perforce be greatly limited: his indirect and vicarious experiences are limited only by the experiences of man and the possibility of representing them to the individual's mind. Such vicarious experiences may be afforded through the fiction of literature or the faithful re-presentation of history and biography. The study of history, therefore, by enlarging the field of individual experience may contribute to the character and conduct of the individual. That contribution may take the direction of stimulating ambition and tendencies to act along certain general lines or it may take the direction of moral education. True it is that the events of history illustrate human action indiscriminately moral or immoral. True it is also that the teaching of history cannot be organized solely or even primarily for purposes of moral education. It is even true that in some cases where the ethical values of the study of history have been emphasized the results have been unsatisfactory: e.g., the development of a patriotism which is vainglorious and unfair to other nations. Nevertheless, it must be recognized that there is a fundamental truth expressed by the aphorism of Terence: "*Homo sum; humani nihil a me alienum puto*"; and that the moral training which may be secured from the study of history has all the advantages and all the disadvantages which are to be found in moral training secured from the study of human experiences in any field. Whether or not the study of history leads to the improvement of character is dependent on the method of such study and the teaching afforded. The essential fact is that history affords plentiful material for such teaching, far transcending the amount of material which can be found in the immediate experience of the individual.

It was suggested above that the attitudes (ideals, ambitions, tendencies to act) developed through the study of history are probably more important than the specific knowledges acquired through such study. For the personal character and conduct of the individual the study of history is valuable for the stimulation of laudable ambitions, of ideals of character, standards of conduct, even certain forms of "hero-worship," which may be guiding forces in the life of the individual. Hence the special value of biography as a part of history and the desirability of some emphasis on the personal conduct and character of truly noble men and women.

(*2*) *The individual's participation in social-group activities:* By far the greater part of the major activities of society are carried on through social institutions (the State, the home, the Church, the vocation, the school). An understanding of such institutions, the interpretation of their ideals, their interrelations, their functions in modern society, cannot be gained without some acquaintance with the nature of their development. Here again the values of the study of such institutions and their interrelations are not to be measured solely, or even mainly, by the extent to which the individual may consciously apply some bits of historical knowledge. Far more important are the attitudes toward social-group activities developed through the study of history and the unconscious tendencies to act in such activities.

It is only when one thinks of the direct social-civic values of the study of history in terms of the applicability of pieces of historical information only and loses sight of the influence of historical study in developing social ideals, social standards, attitudes, and tendencies to act that one is tempted to minimize the social-civic values of the study. Likewise, it is only when the teaching of history develops merely historical information and fails to develop ideals, attitudes, and tendencies to act, that history in the secondary school fails to achieve its most important direct values.

(3) *Integrating values of the study of history:* The study of history must always be one of the important means employed by the secondary school to develop the common knowledges, ideals, standards, traditions, modes of thought and action, essential for social solidarity. The importance of the integrating function of secondary education has been emphasized in prior chapters. To the end of social integration all the social sciences may contribute much. History here possesses peculiar advantages, dealing as it does with conditions which have determined the society in which we live and bringing to consciousness the common activities, traditions, ideals of humanity and of one's own society. Frequently the conception of the integrating value of the study of history has manifested itself in connection with the development of patriotism only. Such a conception is very narrow — narrow not only in the sense that it has frequently emphasized a false type of patriotism, but also in the sense that it loses sight of the fact that the existence of a certain degree of social-mindedness is more essential than loyalty. This is, of course, particularly important in the American democracy. If the study of history fails to aid the development of that unity of sentiment, ideals, thought, and action, which is essential for the endurance and development of democracy, it fails to achieve one of its most important ends.

236. **Direct vocational values claimed.** Direct vocational values to be derived from the study of history for those destined to become teachers of history and certain other subjects, for those destined to enter the field of diplomacy, and for a few others are readily perceived. Such values, however, must be considered limited and highly contingent. Far less contingent and far more general must be considered

those direct vocational values which may be derived from acquaintance with the development of commerce and industry, the part played by economics in social development, the historical relation of the various forms of industry, the changing relations of labor and capital, etc. Here again the development of attitudes and tendencies to act must be conceived as far more important than the accumulation of information. As one of the major social institutions the vocation has important historical associations acquaintance with which may contribute much to vocational efficiency in its broader aspects. Hence the importance sometimes attached to the study of industrial history or commercial history in certain courses of the secondary school. The more history includes a study of economic and industrial factors in the development of civilization — a marked tendency at the present time — the more the study of history may contribute to direct vocational values in the secondary school.

237. **Direct avocational values.** History, as every other study in the program of the secondary school, may establish the basis of a perpetual enjoyment in moments of leisure. Here, however, history can claim little that any other subject which may arouse a special interest cannot claim, except, possibly, where history encroaches on the field of literature in the borderland of mythology, biography, and pseudo-historical material.

238. **Direct propædeutic values.** In many ways the study of history may be considered as a basic study for the study of several other subjects, so much so that whole schemes of education have been built up on the culture-epoch theory with history as its base.[1] Certainly we must recognize the fact that the humanitarian studies, such as the social studies, literature, ethics, philosophy, and the rest, cannot be properly pursued without some basic his-

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[1] Cf. DeGarmo, C., *Herbart and the Herbartians*, pp. 107–29.

torical knowledge and understanding. Direct and indirect propædeutic values are, therefore, to be found in the study of history. To conceive that such values are valid for those only who pursue higher studies in college or the university is to assume that contact with the problems and materials of those studies must be limited to college and university experience. Propædeutic values of the study of history are, of course, as important for those not going to college or the university as for those who do — possibly even more so, since formal education in those fields is lacking for the former.

239. **Conceptual values claimed.** The point was made above that the chief values to be derived from the study of history involved the development of attitudes and tendencies to act on the part of the individual. This point was made in special connection with direct values. Much the same point may be emphasized in connection with certain more comprehensive and more fundamental factors which involve the conscious or unconscious functioning of general social concepts to be derived from the study of history. Among such fundamental concepts may be emphasized those involving the continuity and unity of human experience and of civilization, human activity and social organization as dynamic and evolutionary, the dependence of the present on the past and the responsibility of the present for the future, the relation of the individual to society and its development.[1] It is idle to say that such concepts are not always developed from the study of history. The important point is that they cannot be developed without some acquaintance with history. It is idle also to say that such concepts do not function directly in the activities of the individual. By their very nature such general concepts cannot

[1] Cf. Allen, J. W., *The Place of History in Education*, chap. x; Johnson, H., *The Teaching of History*, pp. 74 *ff*.

be analyzed as to their influence on specific actions, but, since they must represent an important part of one's social philosophy, they must function in every social act of the individual. Though they may function in a fashion which may be considered indirect, their functioning is none the less real — perhaps more real even than the functioning of supposedly specific and direct values.

240. Transfer values claimed. As for most subjects of study in the secondary-school program extensive transfer values are commonly claimed for the study of history. Thus Salmon:[1]

> Moreover, it must be borne in mind that history, like many other subjects, is in the curriculum for a double object — for the direct information that it gives and for its help in mental training.

And Chase:[2]

> Memory is the most wonderful and important of our intellectual faculties, and all that tends to strengthen and develop it is of the highest importance. History is foremost among the studies that do this, for in its very nature it is a memory study, and memory gains facility by practice.

Or Hinsdale:[3]

> While slight attention suffices to show that history has disciplinary values, some well-directed thought is required to discover how great and varied this value is.
>
> Taught even in the poorest way — that is, by dint of iterating and reiterating unorganized facts — it trains the memory; taught philosophically — that is, care being taken wisely to choose and properly to organize the facts — it yields to no other subject in mnemonic value.
>
> All that has been urged concerning the memory will be admitted.

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[1] Salmon, L., "Some Principles in the Teaching of History," *First Yearbook of the National Society for the Scientific Study of Education*, p. 32.

[2] Chase, W. J., on p. 289 of Johnston, C. H. (Editor), *High-School Education*.

[3] Hinsdale, B. A., *How to Study and Teach History*, pp. 7–8.

> But that history is an equally important valuable discipline of the imagination has not been as generally perceived.
>
> But history does far more for the mind than merely to exercise the powers of representation; it is also a valuable discipline of the thinking faculties.

Modern psychology denies the existence of such general faculties or powers as Hinsdale assumes may be so readily trained through the study of history. As was pointed out, however, in discussing the problems of transfer values, the denial of the obsolete "faculty psychology" does not of itself negate the possibility of the transfer of improved efficiency, but demands a reconstruction and reinterpretation of "discipline" in terms of accepted psychological theory. Such a reinterpretation was attempted in Chapter XI and in its general form need not be reconsidered here. Accordingly as one accepts or rejects the possibility of appreciable amounts of transfer he may estimate the transfer values of the study of history. One very important fact, however, is apparently neglected by proponents and opponents of the study of history. The problems of transfer in the case of history are in important respects different from the problems of transfer in the case of most school studies, if, indeed, the problems supposed to involve transfer do really involve it. In the case of most studies for which transfer values are claimed or denied the problem involves the application of improved efficiency acquired in connection with content of one kind to content of a widely different character; e.g., the transfer of improved efficiency acquired in connection with mathematical material to non-mathematical material. In the case of history, however, there is a vast field for the application of improved efficiency gained in connection with specific social data studied to other social data not studied. In other words the improved efficiency is to be employed in connection with content and situations of the same or relatively similar character. This is doubtless a case of transfer, but surely transfer of a far different kind from transfer as commonly considered in relation to most subjects of study in the school.

241. Factors conditioning the values of history. Great as are the values to be derived from the study of history it must be recognized that the subject suffers important limitations. Among those limitations the ones considered below are worthy of special attention.

(1) Subjects of study differ widely in the extent to which their materials lend themselves to ready manipulation for purposes of instruction and learning. This factor has been emphasized by Keatinge:[1]

> Those who write at large on Education seldom realize that the branches of knowledge commonly taught in schools vary greatly in the ease with which they lend themselves to manipulation. . . .
>
> What are the elements necessary in a subject which is to lend itself to manipulation? It is easy to sketch in the qualifications. In the main they are four in number. The apparatus must be inexpensive and readily procured; it must be easy to see what is the teacher's work on the one hand and the boy's work on the other; there must be a facility for setting home work that shall be different in kind from the work done in class, and these exercises must be fairly mechanical (for too much refined judgment must not be expected from the average boy); it must be possible to attain to some generalizations, abstractions, or rules which can be applied to fresh matter. Indeed it is upon the presence of this latter element that most of the others depend.
>
> The older subjects fulfill these conditions well. . . .
>
> When we turn to history we find the conditions very badly fulfilled. It is difficult to devise preparation for the boy other than the learning from a text-book of the facts of the lesson that is to be given or the revising of the facts of a lesson that has been given. In school work it is not always possible to arrive at historical generalizations and apply them to fresh matter.

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[1] Keating, M. W., *Studies in the Teaching of History*, pp. 1–3, 38 *ff*.

The nub of the problem is to be found, of course, in the difficulty of so manipulating the materials of history as to throw them into problem form without which reflective thinking cannot be encouraged or fostered, and to arrange the teaching materials of history in such form as may foster the process of dissociation.[1] It is obvious that, if the principles of social action which it is desired that the study of history should develop are actually to be developed, some means must be provided for the abstraction of those general principles from the historical situations presented. Now it is necessary for favorable conditions of such generalization that a number of situations be presented which are analogous but which differ in all other respects other than the general principle which it is desired to dissociate. The chronological character of history precludes any very effective use of this method. For this reason some have suggested the abandonment of the chronological order in dealing with historical material and the adoption of some method which may make possible comparison and abstraction. Thus Seeley:[2]

> We still arrange historic phenomena under periods, centuries, reigns, dynasties, but what is wanted is a real rather than a temporal classification. The phenomena should be classified under such headings as Constitutional, International, Economical, Industrial, etc. Nor should each state be studied by itself, but all states together, the comparative method being constantly employed, and much attention being given to the classification of states. . . . In short science brings together phenomena of the same kind, but history brings together phenomena of different kinds, which have chanced to appear at the same time.

Such a conception of the teaching of history may be opposed by the statement that it is no longer history which is being studied. Be it so! The answer to such an objection is that the character of the study of "history" in the secondary school is to be determined by the aim which emphasizes the phenomena of human action regardless of chronology. In so far as chronology may assist in the attainment of that aim it is justified. In so far as it fails it must be abandoned for the sake of greater values. In any event the limitations of history must be recognized.[1]

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[1] Cf. sections 169 *ff*.

[2] Seeley, J. R., *Methods of Teaching History*, Pedagogical Library, vol. I, p. 198.

(2) History is not an exact science and can never become an exact science — if, in fact, it may properly be denominated a science at all. The importance of this factor arises not so much from the fact that specific reactions on the part of the individual cannot be exactly determined (a fact which has its advantages as well as its disadvantages), but that the study of history may always be colored by the teacher or textbook and have widely different results for different pupils who have studied the subject. The facts of history are of course certain: our knowledge of them is, however, not always correct, and interpretations of them are sometimes widely divergent. Two dangers, therefore, are always present, one that the pupil may have only an *ex parte* opinion on some social problems, the other that, on finding disagreement among authorities, he may be discouraged in his attempt to arrive at the truth. These dangers are always to be guarded against.

(3) It takes generations to establish a body of theory and practice around the teaching of any subject of study which may be considered relatively stable and efficient. In the development of the study of history in the American secondary school there has been manifest a failure as yet to establish any body of theory and practice which approaches even

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[1] On the problem-solving methods of teaching history see Parker, S. C., *Methods of Teaching in High Schools*, pp. 174 *ff.*; Keatinge, M. W., *op. cit.*, pp. 88 *ff.*

desirable amounts of uniformity and stability. Textbooks vary widely, the contents of courses are greatly dissimilar and the treatment different in many schools where any attempt is made to do more than teach a certain number of facts. It is difficult to determine the actual values accruing from the study of history in the secondary school where such varying conditions are found.

(4) Since the values aimed at in the study of history are in part general and in all cases somewhat intangible it must always be difficult to measure the results achieved. This is, to be sure, true of most subjects of study, but particularly true of those studies whose principal values are to be found in the development of character — moral and social — of the individual. Certain results of teaching in mathematics, in the natural sciences, and in language study may readily be estimated and checked from time to time. In the case of history little can be done in that direction except as far as the accumulation of historical information is concerned.

242. Meaning and scope of civics. The study of civics in the secondary school had its beginning in the study of the federal constitution, various State constitutions, and in a few cases of such material as city charters, in the early high school. Thus at least as early as 1828 Stanbury's *Catechism on the Constitution of the United States* was studied in the English High School of Boston, and in Salem the English High School course of 1842 included the study of "the City Charter, Constitution of Massachusetts, and . . . Constitution of the United States." From the beginning, therefore, the study of "civics" meant the rather formal (frequently catechetical) study of the machinery of State and National government, thus justifying the term "civil government."[1] Throughout the nineteenth century the study of civics included little else than this.

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[1] For example, see Sullivan's *Political Classbook*, or Bayard *On the Constitution*, two books in common use in the earlier high school.

Within the past decade or so the feeling has been growing stronger and stronger that the study of the machinery of the National Government, valuable though it may be made, is far from adequate for the purpose of training citizens. Present-day theory tends to enlarge the meaning and scope of the study of civics in such a way as to involve: (1) emphasis on the commoner elements of social and civic activity in community life; (2) emphasis on the importance of developing tendencies to act and attitudes toward social welfare rather than on mere knowledge of the machinery of government; (3) the extension of the field of civics so as to include the informal activities of social-civic life as well as the more formal political activities; (4) the "vitalization" of civics by emphasizing in the beginning those forms of social-civic activity with which the secondary-school pupil is brought into intimate and immediate contact.

243. The aims and values of civics. The values of the study of civics are to be interpreted in terms of its contributions to the social-civic aim of secondary education primarily. Here are involved: (1) the attainment on the part of the pupil of a knowledge of social-civic relations and institutions, their character, and place in social organization; (2) the development in the pupil of a sense of social-civic responsibility; (3) the development in the pupil of attitudes and tendencies to act in conformance with desirable ideals of social-civic activity. The mere attainment of a knowledge of our social-civic organization or even the development in the pupil of a sense of civic responsibility and ideals of civic conduct is not sufficient. Unless such knowledge, such a sense of social responsibility, such civic ideals, are translated into forms of behavior and result in proper civic action, the values of the study of civics cannot be attained. Here, more than in the case of most studies in the secondary school, direct values are dominant and no accumulation of information concerning the functions of government or the relation of the individual to government can take the place of the development of social attitudes and tendencies to act.

It is unfortunate that the aims of the study of civics are frequently stated in terms of knowledge and that the teaching of civics so frequently results only in the inculcation of civic information. Thus the Committee on the Teaching of Government of the American Political Science Association unfortunately puts the cart before the horse in its statement of the aims of civic instruction:[1]

> The prime purposes of a study of civic relations are so obvious as to require little in the way of discussion. They may be summarized thus:
>
> 1. To awaken a knowledge of the fact that the citizen is in a social environment whose laws bind him for his own good.
> 2. To acquaint the citizen with the forms of organization and methods of administration of government in its several departments.
>
> These objects it is believed can be better attained if the school begins to aid the young citizen not only to think in terms of society but also to translate civic thought into action.

That the study of civics in the past has tended to result in information rather than in behavior is due in large part to the fact that civics has commonly been taught as a study of the broader functions of National and State government and has seldom touched the commoner activities of individuals in community life wherein the actual behavior of pupil-citizens in civic affairs can be directly affected. Modern civics by dealing first with the civic activities which intimately touch the young citizen even as a pupil in the school affords greater opportunity to develop actual habits of behavior in civic affairs. This is one of the prime advantages of "community civics."

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[1] American Political Science Association, Committee on the Teaching of Government, *Report*, p. 27.

244. The scope and function of "community civics." Civics as heretofore presented in the American secondary school has proved comparatively fruitless for a number of reasons: (1) because it has been taught as an abstract science of government; (2) because it has been limited to the larger aspects of National and State government; (3) because it has been taught commonly in the last grade of the secondary school after the majority of pupils have left school; (4) because it has neglected to train pupil-citizens in their immediate community responsibilities, both formal and informal. Community civics is designed to remedy those defects.

Community civics takes its name, not from any restriction of its scope to the smaller community, — village, town, or city, — but from the fact that the social environment of the pupil is conceived as opened up to him through a series of successively enlarged communities or spheres of civic life — family, neighborhood, town, county, State, Nation, Humanity — and that the series of his social-civic contacts or experiences begins with the smaller unit.

The aims of community civics are the same as those mentioned above. They may be stated specifically in the terms of the Committee on Social Studies of the Commission on the Reorganization of Secondary Education:[1]

> (*a*) *Significance of the term "community."* Community civics lays emphasis upon the local community because (1) it is the community with which every citizen, especially the child, comes into most intimate relations, and which is always in the foreground of experience; (2) it is easier for the child, as for any citizen, to realize his membership in the local community, to feel a sense of personal responsibility for it, and to enter into actual coöperation with it, than is the case with the National community.

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[1] *The Teaching of Community Civics*, Bureau of Education Bulletin (1915), no. 23, pp. 11–12. The quotation given was taken from the *Report of the Committee on Social Studies of the Commission on the Reorganization of Secondary Education*, Bureau of Education Bulletin (1916), no. 28, pp. 22–23.

> But our Nation and our State are communities, as well as our city or village, and a child is a citizen of the larger as of the smaller community. The significance of the term "community civics" does not lie in its geographical implications, but in its implications of community relations, of a community of interests. . . . It is a question of point of view, and community civics applies this point of view to the study of the National community as well as to the study of the local community.
>
> (*b*) *Aims of community civics.* The aim of community civics is to help the child to know his community — not merely a lot of facts about it, but the meaning of his community life, what it does for him, and how it does it, what the community has a right to expect from him, and how he may fulfill his obligation, meanwhile cultivating in him the essential qualities and habits of good citizenship.
>
> More specifically this aim is analyzed as follows:
>
> To accomplish its part in training for citizenship, community civics should aim primarily to lead the pupil (1) to see the importance and significance of the elements of community welfare in their relations to himself and to the communities of which he is a member; (2) to know the social agencies, governmental and voluntary, that exist to secure these elements of community welfare; (3) to recognize his civic obligations, present and future, and to respond to them by appropriate action.

Civics, conceived from this viewpoint, should prove a much more efficacious instrument of education in the secondary school than the civics which has hitherto been taught as an appendage to history. It should be clear that the values of such a study are universal and direct. It is imperative therefore, that community civics should be studied by every pupil in the secondary school. It should be clear also that if the study is to produce its greatest values it should not be relegated to the later grades of the school but should be a prominent study in the junior high school before pupils begin to leave school in large numbers.

245. Economics as a study in the program. The study of economics early found some place in the program of the public secondary school. Thus "political philosophy" was prescribed for study in the English Classical (High) School of Boston in 1821 and in Massachusetts "political economy" was required by law to be taught in all larger high schools from 1857 to 1898. Despite its early beginning, however, economics has always occupied a precarious position in the program of the secondary school. When taught it was almost invariably presented in the form of a logically organized science little suited to the needs and capacities of most high-school pupils. Only within the past few years has any attempt been made to organize and teach economic principles in the secondary school in a manner at all adapted to the maturity and capacity of the pupils.

It is clear that the activities of modern industrial and social life in America call for some acquaintance with the common and fundamental principles of economics on the part of every individual. It is clear also that the average man or woman at present is lamentably ignorant of the simplest laws of economics which play such an important part in our social organization. Some provision must be made to meet the apparent need. Some of the necessary economic knowledges can be secured incidentally through the study of geography, history, civics, and other subjects in the elementary and secondary schools. Incidental study of that sort is, however, insufficient. The fact must be faced that large numbers of boys and girls are constantly going forth from the school into the world of industry where they must deal with problems social and industrial which call for a working knowledge of common economic principles. The growing social and political importance of economic problems, the increasing complexity of governmental-industrial relations, the changing relations of capital and labor, of employee and employer, the development of labor organizations, emphasize the need for such instruction at the present time. Unless we are to trust to the influence of demagogues and exploiters of industry some provision must be made in the school for this imminent need.

Common practice relegates all direct instruction in economics to the college or other higher institution. Doubtless the more mature the student the more readily he may understand the principles of economics and the more comprehensive may be his grasp of that science. Hence it is commonly urged that secondary-school pupils are incapable of understanding the principles of economic laws. Such an argument is for the most part based on the conception of economics as a logically organized and complete science. For the study of economics in this sense there is no place in the secondary school. However, many important principles and problems of economics are readily understood and eagerly studied by pupils of secondary-school age. An important distinction should be made between a philosophic study of economics as a logically organized science and a "practical" study of certain of its principles and problems as involved in the activities of "the common man." The philosophic study of economics belongs to higher education. The "practical" study of economic elements has a legitimate place in the program of the secondary school. Either as a separate subject or as an important part of such a composite subject as that considered in the following section, the study of the commoner principles of economics has a legitimate and important place in the program of secondary education.

246. The study of "Problems of American Democracy." The Committee on Social Studies has recommended the study of "Problems of American Democracy, Economic, Social, Political" as a

> culminating course of social study in the last year of the high school, with the purpose of giving a more definite, comprehensive,

> and deeper knowledge of some of the vital problems of social life, and thus of securing a more intelligent and active citizenship.[1]

Two considerations led the committee to make this recommendation: (1) the difficulty of providing for separate instruction in the many social studies which are claimants for a position in the program of the secondary school; e.g., economics, sociology, law, politics, etc.; (2) the fact that in actual life the individual faces problems or conditions in which the principles of a number of social sciences are inextricably related. The committee summarizes its reasons for proposing such a course as follows: [2]

> (1) It is impracticable to include in the high-school program a comprehensive course in each of the social sciences. And yet it is unjust to the pupil that his knowledge of social facts and laws should be limited to the field of any one of them, however important that one may be.
>
> (2) The purposes of secondary education and not the intrinsic value of any particular body of knowledge should be the determining consideration. From the standpoint of the purposes of secondary education, it is far less important that the adolescent youth should acquire a comprehensive knowledge of any or all of the social sciences than it is that he should be given experience and practice in the observation of social phenomena as he encounters them; that he should be brought to understand that every social problem is many-sided and complex; and that he should acquire the habit of forming social judgments only on the basis of dispassionate consideration of all the facts available. This, the committee believes, can best be accomplished by dealing with actual situations as they occur and by drafting into service the materials of all the social sciences as occasion demands for a thorough understanding of the situations in question.
>
> (3) The principles upon which such a course is based are the same as those which have been successfully applied in community civics, sociology, and even history.

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[1] Report of the Committee, *op. cit.*, pp. 52 *ff.*

[2] *Ibid.*, p. 56.

It will be seen from the recommendations of the committee that the organization of the course proposed follows out the ideas dominant in the recommendations for courses in civics, namely that the study should be organized not in terms of the demands of the subject or subjects as logically arranged abstract sciences but in terms of the activities in which individuals participate. The proposal of the committee is worthy of adoption.

247. **Criticism of social studies as now organized.** In the light of the preceding discussion it would appear that several important criticisms may be made concerning the economy of the social sciences in the secondary school as at present organized. Among these may be emphasized the following:

(1) The values of the study of the social sciences in the secondary school have always suffered from the tendency to organize their materials and determine content and method with reference to the organization of the subjects as logical sciences rather than with reference to the needs and capacities of the pupils and with respect to the situations in life in which they may use them. The conception of history from the historian's standpoint rather than from the standpoint of its use as a subject of study in the secondary school has in most cases led to an organization of material and a determination of teaching methods ill-suited to the attainment of the potential values of that subject. Similar results have come from the conception that "civil government" and "political economy" should be taught as logically organized sciences.

(2) In the study of history attention has been given almost exclusively to military and political events to the neglect of important events of social, intellectual, and economic importance. The modern development of the sociological conception of history emphasizes the importance of historical material previously neglected. While it

is "a still unsolved problem . . . to determine what conditions and institutions shall be given the preference, considering the capacity of the students on the one hand, and the limitations of time on the other," it is nevertheless noteworthy that attention is at present being directed toward other elements in history than wars, kings, major matters of national development, and the like.

(3) In spite of the acceptance of a theory that the study of the past should aid in an understanding of the present, the teaching of history in the past has signally failed to relate historical events to the present and future needs of the pupils.

> The ideal history for each of us would be those facts of past human experience to which we should have recourse oftenest in our endeavors to understand ourselves and our fellows. No one account would meet the needs of all, but all would agree that much of what now passes for the elements of history meet the needs of none. . . . No one questions the inalienable right of the *historian* to interest himself in any phase of the past that he chooses. It is only to be wished that a greater number of historians has greater skill in hitting upon those phases of the past which serve *us* best in understanding the most vital problems of the present.[1]

(4) In the past the study of civics has been subordinated to the study of history. For this there can be no justification and modern tendencies to afford civics its proper place in the secondary-school program deserve universal support.

(5) In the past, and in most cases at present, the tendency is to limit the study of civics to the formal study of the machinery of government. If the study of civics is to be made effective its field must be broadened so as to include the study of the commoner affairs of social-civic activity.

(6) The practice, though lessening still dominant, of post-

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[1] Robinson, J. H., "The New History," *Proceedings of the American Philosophical Society*, vol. L, pp. 189–90.

poning the study of American history, and particularly civics, to the later part of the secondary-school course, is very faulty. Such postponement means that two thirds of the pupils entering the high-school course can never receive the necessary benefits of the study of those subjects. The growing practice of offering civics in the earlier years of the secondary school is to be encouraged.

(7) In many secondary schools at the present time it is possible for pupils to pass through the entire course without ever coming into contact with the social sciences. If the values of the study of the social sciences are rightly conceived to be universal and certain, not limited or contingent, it must be recognized that some contact with the social studies should be provided for every pupil in the school.

(8) The study of social sciences other than history and civics is all but neglected in the American secondary school. Such neglect cannot be justified. It must be recognized, however, that the study of social phenomena as abstract and logically organized sciences has no place in the secondary-school program. The correct approach is indicated by the modern tendencies to be found in community civics and is such a course as that proposed in Problems of American Democracy.

PROBLEMS FOR FURTHER CONSIDERATION

1. What are the arguments for and against the study of "history" by institutions rather than by periods? (Cf. Seeley, J. R., *Methods of Teaching History*.)
2. What are the arguments for and against the introduction of a course in "The Study of Nations"? (Cf. Kingsley, C. D., *School and Society*, vol. III, pp. 37–41.)
3. What are the arguments for and against a requirement of some social study by every pupil in each grade of the secondary school?
4. What differences should be made in the social studies of different groups of pupils in the secondary school?
5. Trace the development of social studies in the program of the secondary school.

6. Compare the place of social studies in the secondary schools of America, Germany, and France.
7. For any high school or any group of high schools determine the actual amount of social studies engaged in by members of any "class" throughout the course. Consider those who leave school as well as those who remain throughout the course.
8. Outline a series of problems of topics which would properly find place in a course of "Problems of American Democracy." (Cf. *Report* of the Committee on Social Studies of the Commission on the Reorganization of Secondary Education, pp. 52–56.)
9. To what extent would it be possible to organize history teaching on the form of "problem-solving" exercises? (Cf. Parker, S. C., *Methods of Teaching in High Schools*, p. 174 *ff.*; Keatinge, M. W., *Studies in the Teaching of History*.)
10. Compare several different textbooks in American history with respect to emphasis on political matters, institutional development, economic changes, social changes, military matters, intellectual matters, etc.
11. Compare textbooks in Civics with reference to the amount of attention devoted to various topics.
12. Trace the requirements in social studies for college admission.

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CHAPTER XVII

THE PLACE OF PRACTICAL AND VOCATIONAL ARTS IN THE PROGRAM

I. General Considerations

248. Historical position of the practical arts. While the most noteworthy development of the practical and vocational arts in the program of the secondary school has taken place within the past decade, some beginnings of its development were to be found as early as the beginning of the academy movement and were not lacking in the early high-school movement. In its beginning the public high school was characterized by attempts to provide secondary education for those who were not to receive a college education and there was a real intent on the part of its founders and advocates to provide suitable subject-matter for such boys and girls. Thus in the first high school established, the English Classical (High) School of Boston, it was designed to provide an education for boys which should serve as a foundation for eminence in their professions, "whether mercantile or mechanical." In the early high schools surveying and navigation were taught as early as 1821, bookkeeping by 1823, "commerce" before 1838, stenography as early as 1849, and sewing as early as 1840. It must be recognized, however, that little support was given to such studies and that, even in the case of the few practical subjects receiving a measure of support, the instruction was extremely formal and detached from practical or vocational application. During the last quarter of the nineteenth century increased attention was paid to the clerical or commercial arts, to manual arts, and to the somewhat higher technical arts of industry. Provision for these arts, however, was by no means universal, and in the majority of schools where such studies were provided instruction failed lamentably to fulfill its purpose. Thus in most cases "manual training" took the direction first of general discipline, then of "manual expression," rather than vocational efficiency, and technical education was soon restricted in most high schools to the preparation of boys for entrance to the technical college. Of the vocational subjects the clerical or "commercial" alone had made noticeable headway by the end of the nineteenth century.

About the beginning of the twentieth century a number of important factors began to receive attention and the recognition of their importance has led to a revised conception of the place of practical and vocational arts in the program of the secondary school. Prominent among such factors were recognized the following: (1) the relative ineffectiveness of the formalized education already provided for the practical arts; (2) the changed character of the secondary-school population; (3) the importance of retardation and elimination and the needs of boys and girls who leave school at an early age or stage; (4) the changes which have taken place in other social agencies which formerly provided valuable forms of practical and vocational training; (5) the demands of modern occupational life. Recognition of those and other factors has revolutionized conceptions of the place of the practical and vocational arts in the secondary school and has tended to produce the following results: (*a*) the closer articulation with the actual conditions of workaday life of such practical arts as had already found some place in the program; (*b*) the acceptance of the vocational aim, or at least the applied aim, as the dominant element determining the place and purpose of practical arts in the program;

(*c*) an extension of the number and scope of practical and vocational arts in the secondary school; (*d*) a revision of the aims, values, and methods of almost all subjects of study in the school and attempts to establish their relations to practical life.

249. **Present status in the program.** As far as practical and vocational arts in the secondary school are concerned the present cannot be described otherwise than as a period of experimentation, characterized by endeavors to put into practical operation the conceptions outlined in the preceding paragraph. In the majority of public secondary schools little attempt has been made to meet imperative demands for the organization of practical and vocational arts training either in the secondary school proper or through the secondary school in coöperation with other agencies. In schools where such organization has been attempted the recency of those attempts has permitted the development of few settled policies or conditions. The field of these arts is obviously the field where differentiated education is dominant and, therefore, the field where the greatest amount of variation is to be expected.

At present the majority of public secondary schools in the more progressive communities provide in some degree for certain domestic arts instruction (at least courses in sewing and cooking) and for commercial education (at least in the clerical branches). Far less provision has as yet been made for courses in industrial and agricultural arts, least of all in the former. In the entire field of practical and vocational arts instruction in the school the United States has followed far in the rear of more progressive countries in Europe. However, recent activity by cities, States, and by the Federal Government bids fair to inaugurate a new era for practical and vocational education throughout the country. In particular the federal Smith-Hughes Act, passed by Congress in

February, 1917, must give great impetus to that form of education through the encouragement provided by the appropriation of large sums of money to the several States for the payment of the salaries of teachers, supervisors, and directors of agricultural subjects, the salaries of teachers of trade, home economics, and industrial subjects, and for the training of such teachers, supervisors, and directors.

250. Values of the practical and vocational arts. The fundamental values of the practical and vocational arts in the program of the secondary school are to be determined, of course, in terms of their relation to the economic-vocational aim of secondary education. Those values are direct and specific. In Chapter IV it was shown that little more than one third of those pupils who enter the first grade of the elementary school reach the first grade of the four-year high school; that of those entering the high school about one third leave before the beginning of the second year, about one half leave before the beginning of the third year, two thirds before the beginning of the fourth year; and that of those who enter the seventh grade of the school system about one quarter leave before the eighth grade, one third to one half before the ninth grade, two thirds before the tenth grade, three quarters before the eleventh grade, and nearly four fifths before the twelfth grade.[1] Boys and girls who leave school before the completion of the secondary-school course for the most part enter commercial, industrial, agricultural, and household pursuits. Throughout their lives the economic activities in which they engage will be found in those fields. In 1913 approximately a million and a half boys and girls were enrolled in the seventh grade of the public schools of the United States. Of that number probably 600,000 left school by 1916 and many more will leave school before the end of the secondary school course for that

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[1] Cf. Tables LV, LVI, LVII.

"class" in 1919. It is probable that about one half of those who will complete the secondary-school course in 1919 will enter commercial, industrial, agricultural, and household pursuits, so that in all probability about 1,300,000 boys and girls already have entered or will enter those occupations from that group of children who were in the seventh grade of the schools in 1913. A moderate estimate would place the number of boys and girls leaving school from grades above the sixth grade at more than one million annually. Compared with this the number of those completing the secondary-school course and entering other pursuits in life immediately or later is insignificant. By far the greatest proportion of those leaving school before the completion of the course will engage in practical-arts pursuits. For those pupils instruction in the practical-arts subjects of a vocational purpose and character is necessary and legitimate.

251. Conditions emphasizing practical and vocational arts. Numerous factors have combined to emphasize the values and the place of the practical and vocational arts in the secondary-school program at the present time. All have been considered at some length in preceding sections of this book. They may be summarized briefly here.

(*1*) *Developments in educational theory:* Three important developments in educational theory affect the present situation as far as the practical arts are concerned. (*a*) Much of the failure properly to provide for practical and vocational education during the nineteenth century was due to a belief that "general abilities" suitable for all activities of life could be gained through the intensive study of a few subjects. Thus the founders of the English Classical (High) School of Boston in 1821 desired to provide an education "calculated to bring the powers of the mind into operation" and to "serve as a foundation for eminence in his (the pupil's) profession, whether mercantile or mechanical." Thus the manual training movement ran on the rocks of a belief in the possibility of developing "general manual dexterity" and the accompanying mental powers. Modern psychological and educational theory has greatly restricted the application of any such theory and placed much greater emphasis on specific training. (*b*) Modern educational theory, by determining the values and aims of subject-matter in the secondary school in terms of the contributions made to the activities in which the individual will participate, has greatly increased the attention to be paid to subjects contributing to the attainment of the economic-vocational aim. (*c*) Recognition of the existence, character, and distribution of individual differences in the capacities, interests, and probable future activities of pupils, and recognition of the differentiated needs of society have given increased impetus to the movement to provide a wide range of differentiated studies in the program to meet the needs both of pupils and of society.

(*2*) *Developments in the secondary-school population:* Within the past quarter of a century noteworthy changes have taken place in the secondary-school population. In numbers the secondary-school population has increased from 297,894 pupils (one for every 210 of total population in 1889–1890) to 1,373,661 pupils (one for every 73 of the estimated total population in 1914–1915). In character the secondary-school population has changed from a roughly homogeneous group of those designed for the higher walks of life to a highly heterogeneous group of pupils destined to enter all sorts of occupations.

(*3*) *Developments in other social institutions:* In Chapter IX a somewhat detailed though brief consideration was given to the changes which have taken place in other social institutions tending to decrease the stimuli and opportunities previously afforded for vocational training, and at the same time to demand a higher degree of vocational efficiency. Little further need here be said otherwise than to repeat that the occupations themselves, home and community life, and other agencies have lost many stimuli and opportunities for vocational training which they will probably never recover. Thus the responsibility has been forced on the school for training previously provided more or less adequately by other social agencies.

252. The field of vocational education. Practical-arts and vocational education in the secondary school must be determined by the conditions in the economic world which the pupils will later enter. Some conception of the range, variety, and importance of various occupations may be gained from the occupation statistics presented in the fourth volume of the *Thirteenth Census Report* (1910). The occupations there listed are classified under their main divisions in the following table:

TABLE CXXXIX. NUMBER AND PROPORTION OF PERSONS IN THE GENERAL DIVISIONS OF OCCUPATIONS (1910) *

Occupations	*Numbers*			*Per cents*		
	All	*Male*	*Female*	*All*	*Male*	*Female*
Agriculture, etc.	12,659,203	10,851,702	1,807,501	33.2	36.1	22.4
Extraction of minerals	964,824	963,730	1,094	2.5	3.2	0.1
Manufacturing, mechanical industry	10,658,881	8,837,901	1,820,980	27.9	29.4	22.5
Transportation	2,637,671	2,531,075	106,596	6.9	8.4	1.3
Trade	3,614,670	3,146,582	468,088	9.5	10.5	5.8
Public service †	459,291	445,733	13,558	1.2	1.5	0.2
Professional service	1,663,569	929,684	733,885	4.4	3.1	9.1
Domestic and personal service	3,772,174	1,241,328	2,530,846	9.9	4.1	31.3
Clerical occupations	1,737,053	1,143,829	593,224	4.6	3.8	7.3
Total persons engaged	38,167,336	30,091,564	8,075,772	100.0	100.0	100.0

* *Thirteenth Census Report* (1910), vol. IV, p. 40.

† "Not elsewhere classified."

According to this table the general divisions of occupations engaging as large a proportion as five per cent of men or women are as follows: *men* — agriculture (36.1 per cent), manufacturing and mechanical industry (29.4 per cent), transportation (8.4 per cent), trade (10.5 per cent); *women* — agriculture (22.4 per cent), manufacturing and mechanical industry (22.5 per cent), trade (5.8 per cent), professional service (9.1 per cent, of which more than two thirds are teachers), domestic and personal service (31.3 per cent), clerical occupations (7.3 per cent). From this list some occupations may be eliminated as far as general provision for vocational education in the secondary school is concerned. Thus transportation engages the activity of more than two and one half million men, but far more than one half of that number are unskilled laborers. Thus also professional service engages 733,885 women, but of that number 478,027 are school-teachers for whom higher professional education is necessary. Hence the occupations engaging the largest number of men or women and suitable for consideration in connection with vocational education in the secondary school are agriculture, manufacturing and mechanical industry, trade, domestic service, and clerical occupations.

253. **Relative importance of various occupations.**[1] Variation in the values of various vocational subjects is obviously a very important factor affected extensively by geographical considerations. This is noticeable not only for smaller districts but also for States and even larger geographic divisions. Thus in Mississippi more than three quarters of all workers are engaged in agriculture; in Massachusetts less than five per cent. In Rhode Island more than one half are engaged in manufacturing and mechanical industries; in Mississippi less than eight per cent. In Nevada more than

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[1] All figures in this section are taken from p. 45 of the fourth volume of the *Thirteenth Census Report* (1910).

one fifth are engaged in the extraction of minerals; in Mississippi less than one tenth of one per cent. In California about fourteen per cent are engaged in trade; in South Carolina about three per cent. For geographic divisions of the country the figures are as follows:

TABLE CXL. PERCENTAGES OF WORKERS IN VARIOUS OCCUPATIONS (1910) *

Geographic Division	*Agriculture, etc.* (*per cent*)	*Extraction of minerals* (*per cent*)	*Manufacturing and mechanical industries* (*per cent*)	*Transportation* (*per cent*)	*Trade* (*per cent*)	*Public service* (*per cent*)	*Professional service* (*per cent*)	*Domestic and personal service* (*per cent*)	*Clerical occupations* (*per cent*)
New England	10.4	0.3	49.1	6.5	10.6	1.7	4.8	10.7	5.9
Middle Atlantic	10.0	4.2	40.6	8.0	12.0	1.4	4.9	11.8	7.1
East North Central	25.6	2.6	33.2	7.6	10.6	1.1	4.8	9.2	5.3
West North Central	41.2	1.8	20.0	7.8	10.4	1.1	5.2	8.5	3.9
South Atlantic	51.4	1.8	18.6	5.0	6.1	1.0	3.0	10.5	2.6
East South Central	63.2	1.9	12.4	4.0	5.3	0.6	2.6	8.4	1.7
West South Central	60.1	0.7	12.6	5.2	7.0	0.8	3.3	8.1	2.1
Mountain	32.4	9.4	19.5	10.3	8.7	1.7	5.2	9.1	3.6
Pacific	22.6	2.4	27.2	10.3	12.6	2.0	6.0	11.3	5.5
UNITED STATES	33.2	2.5	27.9	6.9	9.5	1.2	4.4	9.9	4.6

* *Thirteenth Census Report* (1910), vol. IV, pp. 44–45.

This geographic variation in economic activities gives rise to one of the most important problems of vocational education, namely, the problem of adapting it to local conditions as determined by the economic activity and the character of the population served. This problem is best considered in connection with the principles governing the selection of vocational subjects discussed in the following section.

254. Principles governing selection. The wide range and variety of vocational fields and differing local conditions emphasize the factor of selection in determining the character of vocational education in any locality. Here a number of important principles are involved.

(1) Only those occupations which afford opportunity for a relatively large number of skilled workers should be represented by vocational subjects in the secondary school. The economics of secondary-school administration and the law of demand and supply alike negate or affirm the advisability of introducing various vocational subjects into the school.

(2) Only those occupations which have a fairly steady and general demand for skilled workers should be represented by related vocational subjects in the secondary school. No school can afford to introduce vocational subjects when the occupations for which they prepare vary widely in the rate of demand for workers thus prepared.

(3) Only those occupations which offer opportunity for lengthy employment should be represented by related vocational subjects in the secondary school. Society cannot afford to provide expensive vocational education for occupations wherein the worker's usefulness is relatively short as measured by his employment in that occupation.

(4) Only those occupations which offer somewhat progressively increased returns to the individual and to society as the result of progressively increased skill or knowledge should be represented by related vocational subjects in the secondary school. Education in the school cannot assist in the exploitation of the worker by industry.

If our investigation of this question [*Are skilled processes ahead?*] shows that the employment is of the "blind-alley" type, in which two or three weeks, or even less, suffices to master all the technical training and skill that can be employed in the work, — which is true of about eighty-five per cent of the paper-box-making industry and of about an equal percentage of the machine work in shirt and collar factories, — it is evident that no trade training at public expense should be provided. If the advanced processes of the work are so simple in nature that all the knowledge and skill needed can be picked up in the trade itself with what little assistance can be given by a foreman, which is possible in plants working on white goods, in power sewing, straw-hat sewing, and underwear knitting, it is then inadvisable to use public funds for training workers to enter that industry.[1]

(5) Local or sectional occupations which meet the demands suggested above should primarily be represented by related vocational subjects in the secondary school. It is to be noted, however, that dominant local occupations constitute but one of two important factors to be considered. The other factor is the factor of individual differences in capacities and aptitudes in the secondary-school population as related to vocational activities. That a boy or girl is born on a farm or in a rural community is no guarantee whatever that he or she is well fitted to engage in agriculture or that agricultural education is well fitted to his aptitudes and interests. Where a sufficiently large group of pupils is found interested and capable in any single occupation, that occupation should be represented by its related vocational subjects in the school whenever economically possible. Thus, *from the viewpoint of desirability*, industrial subjects have their place in a dominantly rural community and agricultural subjects have their place in an industrial community. *From the viewpoint of practicability* (depending on numbers and tastes), such non-local vocations will be represented in few schools. The two factors of local needs and individual needs must always clash to some extent, and for this there is no remedy other than the establishment of special sectional (e.g., State or county) vocational schools or the development of part-time coöperative education.

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[1] Smith, H. B., *Establishing Industrial Schools*, p. 15. For this whole matter see his excellent chapter I.

II. Clerical and Commercial Subjects

255. The scope of clerical and commercial education. The overlapping of clerical and commercial occupations has led to two errors in the administration of clerical and commercial education in the secondary school: (1) the error of confining clerical education to preparation for business life, and (2) the error of restricting commercial education to the clerical arts in the majority of schools. The latter is by far the more serious error. So-called "commercial courses" are commonly restricted to subjects to which tradition has attached the name "commercial subjects" — stenography, typewriting, bookkeeping, "business arithmetic" — together with some elements of office and business practice. In the larger schools, particularly in special "commercial schools," are frequently found forms of instruction in foreign languages (German, French, and Spanish) adapted to supposed or real commercial needs, special types of science instruction adapted to the same ends, some instruction in design and related arts with application to commercial activities, elementary commercial law, economic or industrial history, economics, etc. It will be noted that most of those courses — the courses forming the backbone of "commercial education" — are almost limited to instruction in the clerical arts or "office" activities and to certain general knowledges, little or no provision being made for other important forms of commercial activity. This appears to be wrong for reasons implied in the following considerations: (1) office work and clerical occupations in general engage but a relatively small proportion of strictly commercial workers, probably not more than about fifteen per cent of all business employees.[1] On the other hand, other business activities engage a relatively large proportion of commercial workers, e.g., retail selling has been estimated to engage more than one third of all business employees. Clerical training is very unsatisfactory for such workers. (2) Those who leave school before the completion of the secondary-school course and who enter business in large numbers, for the most part engage in other phases of business activity than the clerical. Their needs are not well met by clerical courses. (3) Stenography and typewriting are passing more and more into the hands of women or girls and at present a relatively small proportion of clerical positions emphasizing those subjects are occupied by men or boys. (4) Many clerical positions have little or nothing to do with strictly commercial work, e.g., civil-service positions.

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[1] Thompson, F. V., *Commercial Education in Public Secondary Schools*, chap. VI.

Recent theory bids fair to institute two important changes in the administration of clerical and commercial education in the secondary school: (*a*) by recognizing that not all clerical instruction is limited to commercial preparation; (*b*) by extending the scope of commercial education so as to include instruction dealing with merchandizing, selling, and store service.

256. Aims of clerical and commercial subjects. Manifestly the primary aims and values of the study of clerical and commercial subjects in the secondary school are to be determined by their direct and specific contributions toward the attainment of the economic-vocational aim of secondary education. Clerical and commercial activities are obviously activities in which a large proportion of secondary-school pupils will later participate. If the theses formulated in Chapters IX and X of the book are sound it follows that the secondary school should provide preparation for those activities of life in which the pupils will later engage and for which other social agencies do not provide adequate training. Clerical and commercial occupations are activities in which secondary-school pupils do later engage in large numbers. It remains to consider whether other social agencies, including those vocations themselves, provide adequate training. In Chapter IX it was shown that social institutions other than the school have tended to decrease the vocational stimuli and opportunities which they formerly afforded. As affecting the field of clerical and commercial education the following facts may be considered. (1) The demand for clerical efficiency has developed with great rapidity within the past few decades, especially in the non-commercial fields and those fields on the borderline between secretarial and business activities. (2) Within recent years the relatively simple organization of commercial activities has given way to a very complex form of organization; e.g., note the character of business organization in the large department store and the large wholesale house. (3) Commercial competition has developed tremendously, even to the extent of ramified international competition. (4) In recent years less and less opportunity has been offered for "learning the business" and apprenticeship has tended to disappear. (5) Greater sub-division of labor and increased specialization has permeated the business field. (6) In constantly increasing proportions girls and women have engaged in commercial activities. (7) Home and community life have tended to afford less and less opportunity for commercial training. (8) Compulsory school-attendance laws and child labor laws have postponed the age at which children may enter commercial life: hence, (9) the school has taken the boy and girl out of business and thus prevented him from securing even that amount of early commercial training which participation in business might afford. These facts emphasize the value and necessity of adequate instruction in clerical and commercial subjects in the secondary school.

The aims of clerical and commercial education in the secondary school must be the development of direct and specific vocational abilities in the related activities of life in so far as they may be developed in the school. Any attempt to emphasize indirect values, e.g., "values for mental training," involve questionable psychological theories and are likely to diminish the primary vocational values which should be dominant.

257. **The place of clerical arts in the program.** Two reasons for the relatively successful provision of instruction in the clerical arts in the secondary school are probably to be found in the facts: (1) that those arts, while perhaps predominantly commercial, have nevertheless spread to several related fields not primarily commercial or on the borderline between commerce and other fields, e.g., public service, the office of the physician, the lawyer, etc., and the factory office; (2) that certain of the clerical arts deal with abilities even less restricted in their applications, e.g., stenography, typewriting, bookkeeping, etc. The clerical arts, therefore, have somewhat less limited and less contingent values than some strictly commercial arts whose values are limited to commercial vocations and contingent on special activities.

Recognition of the somewhat extended values of certain clerical arts has sometimes led to a much mistaken emphasis on the part of some writers and teachers. Thus importance appears to be attached to "mental discipline" wrongly by Moran: [1]

> Stenography, when properly taught and thoroughly mastered, has even greater value, considered from a purely educational standpoint. To become even a moderately successful stenographer one must have training along several lines, each of which has large educational value. These are as follows: (1) It compels one to

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[1] Moran, S. A., pp. 403–04 of Johnston, C. H. (Editor), *High-School Education*. Cf. Bartholomew, W. E., "Fundamental Aims in the Teaching of Bookkeeping," *Proceedings of the National Education Association* (1916), pp. 362–65.

> think quickly and accurately. It is of great value to any one to be thoroughly awakened mentally and to have acquired power to think clearly. (2) The scientific study and practice of stenography compels the development of greater ability to hear things accurately. The inability of the average high school and college student to hear all that he should hear and hear it accurately is really appalling. Stenography, more than any other study, will very largely overcome this almost universal weakness. (3) Mastering the technic of memorizing is an especially important feature which results from the thorough training of this subject. I do not know of any other subject which affords an equally valuable and specific training. (4) The most important mental training resulting directly from this study is the development of ability to concentrate the whole mind upon the work in hand. . . . Since the study of stenography is especially valuable in developing such power, it seems that there should be no question as to the advisability of introducing this subject in every high school, not only as a part of the commercial course, but also as a regularly disciplinary study.

However far one may desire to extend the study of stenography or any other clerical art on the basis of its direct values, he certainly cannot be justified by modern psychological theory in making any such sweeping claims for the study of stenography or other clerical subject on the basis of such "disciplinary" values as those claimed by the writer above quoted. The problem of disciplinary values was discussed in Chapter XI. It cannot be considered here further than to point out that the theory of faculty psychology implied in the above quotation has long since been abandoned by the psychologist. Where such important direct values manifestly exist it is folly to shift the instruction in clerical arts from the field of direct to indirect values.

258. Analysis of clerical occupations. Some conception of the relative importance of various occupations involving the clerical arts may be gained from the census figures for 1910. They are presented in the following table.

TABLE CXLI. CLERICAL OCCUPATIONS ACCORDING TO THE 1910 CENSUS *

Occupations	*Total*	*Male*	*Female*
Agents, canvassers, and collectors	105,127	96,325	8,802
Agents	50,785	43,495	2,290
Canvassers	18,595	13,980	4,615
Collectors	35,747	33,850	1,897
Bookkeepers, cashiers, and accountants	486,700	299,545	187,155
Clerks (except clerks in stores)	720,498	597,833	122,665
Shipping clerks	80,353	78,192	2,161
Other clerks	640,145	519,641	120,504
Messenger, bundle, and office boys†	108,035	96,748	11,287
Bundle and cash boys and girls	10,866	4,274	6,592
Messenger, errand, and office boys	97,169	92,474	4,695
Stenographers and typewriters	316,693	53,378	263,315
Total	1,737,053	1,143,829	593,224

* *Thirteenth Census Report* (1910), vol. IV, p. 94.
† "Except telegraph and telephone messengers."

This classification presented in the census returns is in many ways very unsatisfactory, but serves at least to indicate the relative prominence of bookkeeping, stenography, and typewriting in occupational life, as well as the relative importance of "clerkship." Of special interest is the number of clerks — about 42 per cent of all engaged in clerical occupations, 52 per cent of all men and 21 per cent of all women engaged in those occupations. If to the numbers given be added clerks separately classified by the Census Bureau as "clerks in stores" the group of "clerks" assumes even greater importance. An analysis of their activities is needed as a basis for proper clerical instruction in the secondary school.

259. **Non-clerical commercial subjects.** As an introduction to the consideration of non-clerical commercial subjects which are or should be in the program of studies of the secondary school we may examine the analysis of business occupations made by the Census Bureau.

TABLE CXLII. TRADE OCCUPATIONS ACCORDING TO THE 1910 CENSUS *

Occupations	*All*	*Male*	*Female*
Bankers, brokers, and money lenders	105,804	103,170	2,634
Clerks in stores†	387,183	275,589	111,594
Commercial travelers	163,620	161,027	2,593
Decorators, drapers, and window dressers	5,341	4,902	439
Deliverymen	229,619	229,469	150
Floorwalkers, foremen, and overseers	20,724	17,649	3,075
Inspectors, gaugers, and samplers	13,446	11,685	1,761
Insurance agents and officials	97,964	95,302	2,662
Laborers — in yards and warehouses	81,123	80,450	673
Laborers, porters and helpers in stores	102,333	98,169	4,164
Newsboys	29,708	29,435	273
Proprietors, officials, and managers ‡	22,362	21,352	1,010
Real estate agents and officials	125,862	122,935	2,927
Retail dealers	1,195,029	1,127,926	67,103
Salesmen and saleswomen †	921,130	663,410	257,720
Undertakers	20,734	19,921	813
Wholesale dealers, importers, and exporters	51,048	50,123	925
Other pursuits (semi-skilled)	41,640	34,068	7,572
Total	3,614,670	3,146,582	468,088

* *Thirteenth Census Report* (1910), vol. IV, p. 93.
† "Many of the 'clerks' in stores evidently are 'salesmen and saleswomen.'"
‡ Not otherwise specified.

Of the business occupations here listed those engaging as large a proportion of men or women as five per cent are as follows:

TABLE CXLIII §

Occupations	*All (per cent)*	*Male (per cent)*	*Female (per cent)*
Clerks in stores	10.7	8.8	23.8
Deliverymen	6.3	7.3	...
Retail dealers	33.1	35.8	14.3
Salesmen and saleswomen	25.5	21.1	55.1
Commercial travelers	4.5	5.1	0.5
Total for five occupations	80.1	78.1	93.2

§ Compiled from Table CXLII.

Of particular interest here are the occupations of "clerks in stores," "salesmen and saleswomen" (the two groups are not clearly to be differentiated), and "retail dealers." Secondary education has in the past recognized preparation for those occupations in the most general way only, emphasizing the clerical arts and "general business knowledge" sides of their activities. The arts of buying, selling, and handling merchandise have been all but neglected in the commercial education provided by the secondary school. Hence the emphasis placed at the present time by specialists in commercial education on "merchandizing, selling, and store service." Those specialists have, however, tended to overemphasize occupations in large commercial organizations, such as department store occupations, at the expense of occupations in "small business." The fact that over thirty-three per cent of all business men and women (35.8 per cent of the male and 14.3 per cent of the female), exclusive of clerical employees, are "retail dealers" should serve to guard us against such possible overemphasis. The need of commercial education for the men and women who become "retail dealers" is indicated by the tremendous "business mortality" of that class — failures due in large part to the lack of the most elementary business knowledge and training.

260. "General subjects" modified. Within the past few years the tendency has gradually developed to provide special forms of instruction in "general subjects" adapted to supposed or real commercial and clerical ends. In this category fall such studies as commercial English, commercial arithmetic, commercial or economic geography, industrial history, commercial German, French, and Spanish, commercial science, commercial design, commercial law, business economics, etc. The varying character of courses given the titles "commercial English," "commercial arithmetic," etc., makes it impossible properly to evaluate them. Some are doubtless quite legitimately given a place in the program of studies. Others are of rather doubtful status or of questionable value in spite of the validity of some elements involved. Thus courses in "commercial English" and "commercial" or "industrial" history have been much questioned for the secondary school. Of particular interest is the tendency found in some cases to substitute for commercial pupils courses in "commercial English" and "industrial history" for the courses in English and in social science provided for other pupils. Whatever arguments may be adduced for courses in "commercial English" and "commercial" or "industrial history" for commercial pupils, there can be no justification for allowing such vocational subjects to take the place of courses in English and social science designed primarily to attain the non-vocational, i.e., the social-civic and the individualistic-avocational, aims of secondary education. "Commercial English" and "industrial history," having the same ends in view as other commercial and clerical subjects, i.e., the attainment of vocational efficiency, must be placed in competition with them, not with subjects whose primary purposes have to do with the social-civic and individualistic-avocational aims.

Of special interest too is the tendency which is becoming prominent to emphasize the commercial values of modern foreign languages. It is altogether probable that too much attention may be paid to such courses as "commercial German," "commercial French," or "commercial Spanish," to the detriment of more important forms of commercial education. It must be recognized that in this country peculiar conditions exist greatly limiting the commercial values of the study of foreign languages. (1) It must be recognized that, while American commerce and business have been brought into close contact with foreign peoples, the number of commercial positions affected is insignificant, and that the relatively small number of business positions offering opportunity for, much less requiring, the use of a foreign language makes an ability to use it relatively unimportant. (2) It must also be recognized that the heterogeneity of our American population provides a relatively large number of bilingual men and women with whom it is impossible for the school-taught American boy or girl to compete in securing commercial positions calling for an ability to use a foreign language. For the majority of commercial pupils the direct values of the study of a foreign language are relatively insignificant.

261. Criticism of present commercial education. Provision for commercial education which is or should be made in the secondary school affects three groups of subjects: (1) clerical-commercial arts; (2) merchandising arts; (3) ancillary subjects.

(*1*) *Clerical-commercial subjects:* Better provision is made for these subjects than for any other group. Errors involve (*a*) the tendency to limit clerical instruction to business fields, and (*b*) the tendency to consider clerical instruction suitable for the majority of business occupations.

(*2*) *Merchandising subjects:* Subjects falling under this category at present found in the secondary school are to be catalogued much as the snakes of Ireland or the ships of the Swiss navy — there are none. The point has been emphasized sufficiently in preceding sections that provision for non-clerical business education is an imperative necessity demanded by modern business conditions and sound educational theory. Until provision is made for such subjects commercial education in the secondary school must be far from adequate.

(*3*) *Ancillary subjects:* The present tendency to adapt almost all the traditional subjects of the secondary-school program to commercial ends is equally dangerous for commercial-vocational education and for other forms of secondary education. A careful re-analysis of the values of many subjects of study which have been given a commercial turn in some schools is necessary. It is probable that for the most part they will be found to be highly limited and highly contingent.

III. Industrial Subjects

262. Meaning and scope of industrial education. Industry in its broadest sense may include practically all forms of economic activity. In its narrower sense it is restricted to those activities which involve the manipulation of raw materials and their conversion into finished products through manufacture and mechanical processes. Industrial education, therefore, in the corresponding narrower sense, is that division of education whose primary purpose is the development of industrial efficiency in manufacture and mechanical processes. Elementary education is concerned in an indirect way only with industrial education. The college or higher technical school is the field for higher technical training. The field of industrial education in the secondary school is, therefore, training for the development of vocational efficiency in those industrial activities between those limited to unskilled labor and those demanding a higher degree of technical knowledge and training than can be acquired in the secondary school.

Until within the past few years industrial education in its proper form has been all but neglected in the American secondary school. It has been pointed out already that the manual training movement and the establishment of a few "technical high schools" failed to accomplish the real ends of industrial education, the former by taking the direction of "general discipline," "general manual dexterity," or "culture," and the latter by becoming merely preparatory schools to higher technical colleges. Meanwhile European countries established relatively effective education in the industrial arts and some beginning of real industrial education was made as the result of private initiative in this country Slowly the movement toward industrial education has found its way to a limited extent into the public school system. Legislation providing for the establishment of industrial schools for boys and girls began in Massachusetts in 1906, followed by legislation in Wisconsin in 1907, and by legislation in several other States later. Notwithstanding rather extensive development in educational theory and notwithstanding the somewhat comprehensive legislation provided in many States it cannot be said that the development of industrial education in the secondary school has as yet proceeded far. Relatively few secondary schools at the present time offer any form of industrial education, and in still fewer secondary schools has anything like adequate provision been made for it. Much may be expected, however, in the near future from the passage of the Smith-Hughes Federal Law in 1917.

263. Conditions emphasizing industrial education. Many factors have combined to emphasize the need for industrial education in the secondary school in this country. They are in the main those factors outlined briefly above in this chapter under three heads: (1) developments in educational theory, (2) developments in the secondary-school population, and (3) developments in other social institutions. Certain specific factors, however, deserve special consideration here. (*a*) Modern psychological and educational theory postulates that "general education" is very inadequate preparation for efficiency in industrial activity. (*b*) It likewise postulates that the values, character, and aims of instruction should be determined by the character of the activities in which pupils will later participate. (*c*) It further postulates that there are wide ranges of individual differences in the vocational interests and aptitudes of secondary-school pupils. (*d*) Within the past three decades increasing large numbers of boys and girls destined for vocational activity in the industries have entered the secondary school. (*e*) Studies in retardation and elimination have shown that the majority of pupils entering the secondary school leave after one, two, or three years of secondary education. Such boys and girls enter the industries in large numbers. (*f*) Informal education in the home and community life has lost many of the stimuli and opportunities for industrial education. (*g*) The relative proportion of individuals engaged in industrial pursuits has gradually increased since 1880.[1] (*h*) The constantly increasing division of labor has tended to prevent those engaging in industrial activities from securing in industry itself broad training in the trades and crafts. (*i*) The development of the factory system of industry has removed many other stimuli and opportunities for industrial training. (*j*) The apprentice system which formerly afforded valuable industrial education has tended to disappear, only 118,964 apprentices being accounted for in the entire country in the reports of the 1910 census. (*k*) With other changes in industrial organization the relations between employer and employee have radically changed with the result that the capitalist employer is concerned with the immediate economic productivity of the employee rather than with the broad training of the beginning employee. (*l*) International competition in industry has tended to demand a higher degree of industrial efficiency in this country. (*m*) Changes in the parts played by abundant natural resources and in dustrial efficiency have created a demand for the increase of the latter to offset a relative decrease in the former. (*n*) The increased mobility of labor has tended to discourage attempts on the part of employers to train a body of broadly expert workmen and workwomen who may leave his employ at any moment after he has gone to the expense of their industrial education. (*o*) Compulsory school-attendance laws and child-labor laws have removed children from industry where they could receive even such industrial training as industry provides. (*p*) The school has tended more and more to occupy boys and girls at ages when they formerly engaged in industrial activities.

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[1] *Thirteenth Census Report* (1910), vol. IV, p. 41.

264. Values and aims of industrial subjects. As in the case of all subjects of study whose primary aims and controlling purposes involve the development of vocational efficiency, the values of industrial subjects in the program of the secondary school are to be determined by their direct and specific contributions to the economic-vocational aim of secondary education. It must be recognized that the preparation of the worker is one of the necessary aims of secondary education. It must be recognized that a large proportion of secondary-school pupils will later engage in industrial occupations. It must be recognized that other social agencies than the school, including the industries themselves, do not provide adequate training for those who participate in industrial activities. Recognition of those three facts renders imperative provision for industrial education in the secondary school. It should be noted in this connection, however, that acceptance of the validity of claims for industrial subjects in the program of the secondary school does not necessarily imply that those studies are to be conducted in the secondary-school *building*. The question whether the studies should be provided under school conditions in the secondary-school building or in the industries themselves by coöperation between the school authorities and industrial firms is a matter not of the secondary-school program but of organization and administration. It will be considered in Chapter XXI.

265. Analysis of industrial occupations. As a basis for evaluation of some phases of industrial education in the secondary school we may consider the distribution of in-

TABLE CXLIV. NUMBER OF PERSONS TEN YEARS OF AGE AND OVER ENGAGED IN PRINCIPAL MANUFACTURING AND MECHANICAL INDUSTRIES, CLASSIFIED BY SEX (1910)*

Occupations	*Total*	*Male*	*Female*
Apprentices	118,964	103,369	15,595
Bakers	89,531	84,752	4,779
Blacksmiths, forgemen, and hammermen	240,519	240,488	31
Brick and stone masons	169,402	169,387	15
Builders and building contractors	174,422	173,573	849
Carpenters	817,120	817,082	38
Compositors, linotypers, and typesetters	127,589	113,538	14,051
Dressmakers and seamstresses (not in factory)	449,342	1,582	447,760
Electricians and electrical engineers	135,519	135,427	92
Engineers (stationary)	231,041	231,031	10
Firemen (except locomotive and fire department)	111,248	111,248	.....
Foremen and overseers (manufacturing)	175,098	155,358	19,740
Laborers (not otherwise specified)			
Clay, glass, and stone industries	154,826	152,438	2,388
Food industries	82,015	75,691	6,324
General and not specified laborers	869,478	853,679	15,799
Helpers in building and hand trades	65,431	65,352	79
Lumber and furniture industries	317,244	313,228	4,016
Metal industries	527,714	518,935	8,779
Textile industries	87,146	71,107	16,039
All other industries	385,852	350,917	34,935
Machinists, millwrights, and toolmakers	488,049	487,956	93
Managers and superintendents (manufacturing)	104,210	102,748	1,462
Manufacturers and officials	256,591	251,892	4,699
Milliners and millinery dealers	127,906	5,459	122,447
Moulders, founders, and casters (metal)	120,900	120,783	117
Painters, glaziers, varnishers, enamelers, etc.	337,355	334,814	2,541
Plumbers and gas and steam fitters	148,304	148,304	.....
Semi-skilled operatives (not otherwise specified)			
Cigar and tobacco factories	151,519	79,947	71,572
Clay, glass, and stone industries	88,628	79,167	9,461
Clothing industries	144,607	95,715	48,892
Food industries	88,834	52,312	36,522
Lumber and furniture industries	167,490	154,292	13,198
Metal industries	438,063	394,175	43,888
Printing and publishing	67,469	32,808	34,661
Shoe factories	181,010	121,744	59,266
Textile industries	650,260	298,221	352,039
All other industries	463,655	318,221	145,434
Sewers and sewing machine operators (factory)	291,209	60,003	231,206
Shoemakers and cobblers (not in factory)	69,570	68,788	782
Tailors and tailoresses	204,608	163,795	40,813
Tinsmiths and coppersmiths	59,833	59,809	24
All others in this division	679,310	668,766	10,544
Total in manufacturing and mechanical industries	10,658,881	8,837,901	1,820,980

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* *Thirteenth Census Report* (1910), vol. IV, p. 53. Cf. the more detailed analysis on pp. 91–94 of that volume.

dustrial workers according to their principal occupations. In Table CXLIV are presented figures showing the number of persons engaged in each of forty-two principal industrial occupations in 1910.

From this table it will be seen at once that the clothing and textile trades engage the great majority (nearly two thirds) of all females in industrial pursuits — dressmaking, etc., 24.6 per cent; millinery, 6.7 per cent; sewing, 12.7 per cent; tailoring, 2.2 per cent; laborers in textile industries, 0.9 per cent; semi-skilled operatives in textile industries, 19.3 per cent; total, 66.4 per cent.

The industrial occupations of males are naturally far more diverse. Nevertheless if in considering the data given in Table CXLIV we examine fairly specific occupations and ignore males listed under the headings "general and not specified laborers," "laborers in all other industries," "semi-skilled operatives in all other industries," "all others in this division," and "manufacturers and officials" (these together composing 27.7 per cent of the entire group), we find but nine separately listed occupations representing only the six general fields of metal-working, wood-working, machinist trades, painting trades, stationary engineering, and textile trades, engaging each as large a proportion as two per cent of all industrial male workers — carpentry, 9.2 per cent; laborers in lumber and furniture industries, 3.5 per cent; blacksmiths, etc., 2.7 per cent; laborers in metal industries, 5.9 per cent; semi-skilled operatives in metal industries, 4.5 per cent; machinists, 5.5 per cent; painting, etc., 3.8 per cent; stationary engineers, 2.6 per cent; semi-skilled operatives in textile industries, 3.4 per cent; total, 41.1 per cent of all male industrial workers. Grouped according to the six general fields the figures are: wood-working industries, 12.7 per cent; metal-working industries, 13.1 per cent; machinist trades, 5.5 per cent; painting trades, 3.8 per cent;

stationary engineers, 2.6 per cent; textile industries, 3.4 per cent.

Further light may be shed on this problem by considering the industrial occupations of persons classified on a somewhat different basis as follows:

TABLE CXLV *

I. Building trades: builders and building contractors, brick and stone masons, laborers not otherwise specified in building and hand trades, painters, glaziers, varnishers, etc. (building), paper hangers, plasterers, plumbers, gas- and steam-fitters, roofers and slaters, structural iron-workers (building) — all, 1,799,242; male, 1,781,316; female, 17,926.

II. Metal-working trades: blacksmiths, forgemen, and hammermen, boiler-makers, filers, grinders, buffers, and polishers (metal), furnacemen, smelterers, heaters, pourers, etc., jewelers, watchmakers, goldsmiths, silversmiths, tinsmiths, coppersmiths, laborers not otherwise specified in iron and steel industries, laborers in other metal industries, moulders, founders, and casters (metal), rollers and roll hands (metal), semi-skilled operatives not otherwise specified in iron, steel, and other metal industries, annealers, and temperers (metal) — total, 1,570,448; male, 1,512,171; female, 58,277.

III. Clothing trades: dressmakers and seamstresses (not in factory), laborers in clothing industries not otherwise specified, laborers in shoe factories not otherwise specified, milliners and millinery dealers, semi-skilled operatives not otherwise specified in clothing industries, semi-skilled operatives not otherwise specified in shoe factories, sewers and sewing-machine operators (factory), shoemakers and cobblers (not in factory), tailors and tailoresses, dyers — total, 1,502,819; male, 543,858; female, 958,961.

IV. Wood-working trades: cabinet-makers, carpenters, laborers and semi-skilled operatives not otherwise specified in lumber and furniture industries — total, 1,343,746; male, 1,326,486; female, 17,260.

V. Textile trades: laborers and semi-skilled operatives in textile industries not otherwise specified — total, 737,406; male, 369,328; female, 368,078.

VI. Machinist trades: machinists, millwrights, and tool-makers, loom-fixers, mechanics not otherwise specified, mechanical engineers — total, 550,604; male, 550,469; female, 135.

VII. Food industries: bakers, butchers and dressers (slaughterhouse), laborers and semi-skilled operatives not otherwise specified in food industries, laborers and semi-skilled operatives not otherwise specified in cigar and tobacco industries, laborers and semi-skilled operatives not otherwise specified in liquor, beverage industries, millers of grain, flour, feed, etc. — total, 518,154; male, 391,538; female, 126,616.

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* Compiled from data given on pages 91 *ff.* of the *Thirteenth Census Report* (1910), vol. IV.

VIII. Engineers (*stationary, and firemen*): exclusive of locomotive and fire department — total, 342,289; male, 342,279; female, 10.

IX. Printing trades: compositors, linotypers, and typesetters, electrotypers, stereotypers, and lithographers, engravers, pressmen, laborers, and semi-skilled operatives not otherwise specified in printing and publishing industries — total, 248,656; male, 196,813; female, 51,843.

X. Ceramic trades: laborers and semi-skilled operatives not otherwise specified in clay, glass, and stone industries — total, 243,454; male, 231,605; female, 11,849.

XI. Electric trades: electricians and electrical engineers, laborers not otherwise specified in electric light and power plants, laborers and semi-skilled operatives not otherwise specified in electric supply factories — total, 179,806; male, 167,127; female, 12,679.

XII. Supervisory and executive occupations: manufacturers and officials, managers and superintendents (manufacturing), foremen and forewomen (manufacturing) — total, 535,899; male, 509,998; female, 25,901.

XIII. All other trades: total, 967,394; male, 811,544; female, 155,850.

XIV. Apprentices: total, 118,964; male, 103,369; female, 15,595.

Table CXLVI indicates the relative numbers of persons engaged in the various industries on the basis of the preceding classification.

In spite of the wide variety of specialized occupations falling within each of the general groups considered, in spite of the variation in different localities, in spite of the fact that the total number of workers engaged in any industry does not show the proportion of somewhat skilled workers, and in spite of the obviously inadequate information afforded by the figures presented, Tables CXLIV, CXLV, and CXLVI show that the building, metal-working, clothing, wood-working, textile, and machinist trades engage by far the greatest proportion of industrial workers — 70.4 per cent of all industrial workers, 68.9 per cent of male, and 78.1 per cent of female. The major specialized and skill-demanding trades involved in those general trades must, therefore, form the backbone of industrial education in the secondary school for the country at large.

TABLE CXLVI *

Group	*Trades as above classified*	*Per cent of all engaged in manufacturing and mechanical industries*			*Per cent of all engaged in gainful occupations*		
		All (per cent)	*Male (per cent)*	*Female (per cent)*	*All (per cent)*	*Male (per cent)*	*Female (per cent)*
I	Building trades	16.9	20.2	1.0	4.6	5.9	0.2
II	Metal-working trades	14.7	17.1	3.2	4.2	5.0	0.7
III	Clothing trades	14.1	6.2	52.7	3.9	1.8	11.9
IV	Wood-working trades	12.6	15.0	0.9	3.5	4.4	0.2
V	Textile trades	6.9	4.2	20.3	1.9	1.2	4.6
VI	Machinist trades	5.2	6.2	(?)	1.4	1.8	(?)
VII	Food industries	4.9	4.4	6.9	1.3	1.3	1.6
VIII	Engineers and firemen	3.2	3.9	(?)	0.9	1.1	(?)
IX	Printing trades	2.3	2.2	2.8	0.7	0.7	0.6
X	Ceramic trades	2.3	2.6	0.6	0.7	0.8	0.2
XI	Electric trades	1.7	1.9	0.7	0.5	0.6	0.2
XII	Supervisory positions	5.0	5.8	1.4	1.4	1.7	0.4
XIII	All other industries	9.1	9.2	8.6	2.6	2.7	1.9
XIV	Apprentices	1.1	1.1	0.9	0.3	0.3	0.2
	Total	100.0	100.0	100.0	27.9	29.3	22.7

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* Compiled from data given in Table CXLIV and from data given by the *Thirteenth Census Report* (1910), pp. 91 *ff.*

266. Variation in industrial conditions. While the main fields of industrial activity mentioned in the preceding paragraph will in all probability suggest the principal lines of industrial education for the country at large, differing conditions in various localities must affect the specific trades within those principal divisions and in many cases emphasize trades engaging a relatively small proportion of industrial workers throughout the country but engaging a relatively large proportion of industrial workers within a particular district or community. Thus in Waterbury, Connecticut, more than one half of the industrial workers are semi-skilled or skilled workers in the metal industries; in Tampa, Florida, more than one half are skilled (few) or semi-skilled (many) workers in the cigar and tobacco industries; in Woonsocket, Rhode Island, more than one half are semi-skilled (many) or skilled (few) workers in the textile industries; in Lynn, Massachusetts, more than one half are semi-skilled (many) or skilled (few) workers in the shoe industries; etc. On the other hand, in the majority of communities of such size as to warrant and permit any considerable attention to industrial education in the regular public secondary school, industries are noticeably varied. In any case an "industrial survey" to ascertain the relative importance of various trades exemplified in local industries and to determine the numbers of semi-skilled or skilled workers employed is a necessary preliminary to the selection of industrial occupations which should be represented by vocational subjects in the secondary school of any community.[1]

267. The selection of industrial subjects. Some general principles governing the selection of vocational subjects were outlined in section 254. They apply with special force to industrial education in the secondary school. A number of factors, however, invite particular attention.

(1) The problem of industrial education involves special difficulties in the small school where pupils who are likely to engage in industrial activities are too few to permit the economical introduction of industrial subjects. Apparently the only solution to that problem is the establishment of sectional industrial or generally vocational schools or the introduction of part-time coöperative education. In other small but somewhat larger schools in somewhat larger communities where local industrial activities are fairly important but rather varied and where the number of pupils likely to engage in industrial occupations is large enough to warrant the introduction of some industrial education, the problem of selection of industrial subjects becomes acute. In such communities any attempt to meet the needs

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[1] Cf. *Report of the Minneapolis Survey for Vocational Education.*

of special local industries, except in so far as they may represent generally important trades, must be discouraged, and industrial subjects must be chosen which represent occupations having a steady and general demand throughout the state or country.

(2) A newly established local industry or an industry for a time rapidly growing frequently creates a demand for skilled workers which is but temporary. Care must be taken that industrial education be provided for those occupations which have a fairly steady and general demand; e.g., in many communities the manufacture of various war supplies has received a tremendous impetus during the European war. The demand for skilled munition workers is at present greatly exaggerated and cannot long remain at its present high status.

(3) In many industries there is a constant change in the workers employed and the period of service in certain trades is so short as to preclude opportunity for satisfactory industrial training related to those occupations in the secondary school.

> This constant change, we have already seen, is true of the workers in our canning factories and of those in knitting mills and mills producing low-grade cotton textiles. Similar instability is found among the workers on the simpler processes in the making of harvesting machinery and in one instance a foundry employing three thousand men reported twenty-six hundred yearly changes. Where men and women are continually shifting from one line of employment to another, the community cannot afford to finance their vocational training until a study of the trade shall reveal that there are skilled processes requiring special training which this shifting group has never received and which might be expected to hold them more uniformly in one industry.[1]

(4) In different industries the proportions of skilled, semi-skilled, and unskilled laborers vary greatly. Thus the indus-

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[1] H. B. Smith, *Establishing Industrial Schools*, p. 13.

trial workers of Minneapolis in 1915 were distributed as follows:

TABLE CXLVII. DISTRIBUTION OF SKILLED, SEMI-SKILLED, AND UNSKILLED WORKERS IN THE MANUFACTURING AND MECHANICAL INDUSTRIES OF MINNEAPOLIS, 1915 *

Industries	*Skilled*		*Semi-skilled*		*Laborers*		*Total*
	Male	*Female*	*Male*	*Female*	*Male*	*Female*	
Building trades	9,379	2	....	...	5,494	61	14,935
Metal industries	5,324	2	1,743	52	839	7	7,967
Clothing	1,236	4,792	144	134	3	...	6,309
Supervisors and technicians	5,310	175	...	...	...	...	5,485
Lumber and furniture	1,272	15	1,379	42	1,347	10	4,065
Food and grain	1,031	57	851	477	613	17	3,046
Chemical and drug	2,405	6	76	45	272	3	2,807
Printing and engraving	1,184	62	294	266	9	2	1,817
Textile	2	...	185	684	48	13	932
Boots, shoes, and leather	307	2	440	121	18	4	892
Clay, glass, and stone	150	...	283	4	278	1	716
Tobacco	...	...	244	99	4	2	349
Liquor and beverage	...	...	203	8	126	1	338
Jewelry	150	4	16	1	...	...	171
All other industry	701	20	1 110	764	821	4	3 420
Total	28,451	5,137	6,968	2,697	9,872	125	53,250
Per cent	53.4	9.7	13.1	5.0	18.6	0.2	100.00

* *Report of the Minneapolis Survey for Vocational Education*, Bulletin no. 21 of the National Society for the Promotion of Vocational Education, p. 15.

Those trades or parts of trades only which offer some opportunity for the utilization of somewhat skilled workers in fairly large numbers should be represented by related industrial courses in the secondary school.

(5) Some trades are of such a character that related industrial training cannot be provided within the secondary school building and under ordinary school conditions. Provision can be made for industrial education in such fields only through part-time work, continuation schools, or specially organized institutions.

268. "General subjects" modified. The practice initiated in special type vocational schools of adapting "general subjects" to special supposed or real industrial needs has tended to spread to the modification of such subjects for the same purpose in the regular secondary school. Notwithstanding the fact that something may legitimately and economically be done in this direction there is danger that artificial differentiation may result in damage both to industrial education and to other educational needs. In general much of the comment made in section 260 dealing with clerical and commercial education applies here also. For instance it must be recognized that courses in English and social science exist in the secondary-school program for purposes which are not primarily vocational. It must be remembered that the worker is also to be a citizen and an individual. The threefold nature of his activities cannot be neglected: neither can one group of subjects or one kind of education lead effectively to all three ends at the same time. "Industrial English" and "industrial history," however legitimately they may find a place in that part of the school program dealing specifically with industrial education, can never take the place of the English and social science designed for other purposes. They must, if justified at all, be supplements to and not substitutes for related courses designed to contribute toward the social-civic and individualistic-avocational aims of secondary education.

IV. Agricultural Subjects

269. The scope of agricultural education. Although some attention has been paid to agriculture in certain of the academies before 1850, the present vocational movement began with the establishment of special agricultural high schools in connection with agricultural colleges (first in Minnesota in 1888). The movement somewhat later spread to special sectional agricultural high schools but not until within the past ten or fifteen years was agricultural education introduced into the regular public secondary schools to any noteworthy extent. Previous to 1906 there were but few high schools (excepting agricultural high schools) giving instruction in agriculture.[1] In 1912–13 there were about 2300 high schools (2128 ordinary high schools) in the country teaching agriculture.[2] In 1914–15 such instruction was afforded in 4390 public secondary schools and 83,573 public secondary-school pupils were enrolled in agricultural courses.[3] Favorable legislation granting State and National aid to agricultural education will in all probability greatly extend its scope within the next few years, giving greater and greater importance to the agricultural subjects in the secondary-school program of studies.

The recency of agricultural education in the public secondary schools has prevented the development of many stable policies or practices, particularly since much of the work in agriculture varies somewhat according to geographical factors. Lack of even the roughest standardization renders impossible analysis of practice affecting specific subjects for agricultural education.

270. Factors emphasizing agricultural education. As is the case with other forms of vocational education several factors have combined to emphasize agricultural education in the secondary school at the present time. The more important of those factors may be summarized briefly here. (*a*) Modern educational theory cannot recognize the claim that a "general education" provides satisfactorily for the life which the agriculturalist must lead. (*b*) Modern educational theory postulates that the values, character, and aims of instruction should be determined by the activities in which the pupils will later participate. (*c*) Within recent years boys and girls whose destinies in life are found on the farm have entered the secondary school in increasing numbers. (*d*) Within a relatively short period of time the parts played in production by abundant natural resources and agricultural efficiency have changed to a marked degree. If production is to keep pace economically with demand, the inefficient agricultural work of the past must give way to a higher degree of efficiency in order to offset the relative decrease in abundant natural resources. (*e*) In the field of animal husbandry in particular the decrease in the amount of land which may economically be devoted to stock raising and grazing demands far greater efficiency in order to offset that loss. (*f*) Competition in agricultural production has constantly increased as increased transportation facilities have extended the field of competition even to international proportions. (*g*) The increased application of science to agriculture and animal husbandry has tended to demand a higher degree of knowledge and skill for the successful pursuit of those occupations. (*h*) The increased scientific and technical knowledge and skill demanded for agricultural occupations has rendered the ordinary life of the boy or girl on the farm less and less an adequate preparation for efficiency in those occupations. (*i*) Compulsory school-attendance laws and child-labor laws have removed children from early apprenticeship on the farm where they formerly received early agricultural training. (*j*) The school has tended more and more to occupy boys and girls at ages when they formerly were engaged in agricultural activities. (*k*) There has been a very noticeable tendency for large numbers of boys and girls to leave the farm and engage in urban occupations. The education which has heretofore been afforded the country boy and girl has encouraged this migration by providing the kind of education in elementary and secondary school which gave little preparation for farm life and much for city life. (*l*) More than nine tenths of the public secondary schools in the country are found in communities of less than eight thousand inhabitants and considerably more than one half of the secondary-school pupils in the country are found in the small-town or rural communities.[1]

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[1] Davis, B. M., *Agricultural Education in the Public Schools*, p. 119.

[2] *Report of the United States Commissioner of Education* (1913), vol. I, p. 213.

[3] *Ibid.* (1916), vol. II, p. 497.

271. Aims and values of agricultural education. The aims of the study of agricultural subjects in the secondary school are obviously those emphasizing the economic-vocational aim of education. Accordingly the values of various agricultural subjects in the program are to be determined by the contributions which those subjects may make to the economic-vocational efficiency of individuals who will be engaged primarily in agricultural occupations. Those values are direct and specific, though limited for the most part to pupils who will participate primarily in agricultural activities. In agricultural education, therefore, indirect and general aims must be subordinated to direct and specific aims. Emphasis on "disciplinary values" (themselves questionable) is of questionable validity when brought into such sharp contrast with the direct and specific vocational values of agricultural study in the secondary school. Hence may be questioned the emphasis by Robison:[2]

> Reasoning ability not due to heredity results largely from repeatedly forming and correcting judgments. Casual examination of the materials of high school agriculture show that they offer abundant opportunities for doing this.

272. Analysis of agricultural occupations. For purposes of securing a basis for agricultural education in the secondary school an examination of census statistics is of relatively little value. Nevertheless the figures presented below will at least emphasize the fact that the great majority of agricultural workers is composed of "farmers" and "farm laborers" whose occupations demand a rather general agricultural training rather than training in one limited phase of agricultural activity.

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[1] Cf. Section 32.

[2] Robison, C. H., p. 384 of Johnston, C. H. (Editor), *High School Education.* Quoted with the permission of the publishers, Charles Scribner's Sons.

TABLE CXLVIII. DISTRIBUTION OF AGRICULTURAL WORKERS IN 1910 *

Occupations	*Numbers*			*Per cents*		
	All	*Male*	*Female*	*All*	*Male*	*Female*
Dairy farmers	61,816	59,240	2,576	0.5	0.6	0.1
Dairy farm laborers	35,014	32,237	2,777	0.3	0.3	0.2
Farmers	5,865,003	5,607,297	257,706	47.2	52.9	83.8
Farm laborers	5,975,057	4,460,634	1,514,423	48.1	42.0	14.3
Foremen, farm, dairy, gardens, etc.	47,591	39,826	7,765	0.4	0.4	0.4
Gardeners, florists, fruit growers, etc.	139,255	131,421	7,834	1.1	1.2	0.4
Garden, greenhouse, etc., laborers	133,927	126,453	7,474	1.1	1.1	0.4
Stock herders, drovers, feeders, etc	62,975	62,090	885	0.5	0.6	0.1
Stock raisers	52,521	50,847	1,674	0.4	0.5	0.1
Other agricultural and animal workers	44,238	40,408	3,830	0.4	0.4	0.2
Total	12,417,397	10,610,453	1,806,944	100.0	100.0	100.0

* From p. 91 of the *Thirteenth Census Report* (1910), vol. IV. In the table given above are omitted figures for fishermen, oystermen, lumbermen, etc. Figures for female farm laborers are probably somewhat unreliable.

The most noteworthy fact emerging from these figures is that "farmers" and "farm laborers" comprise more than 95 per cent of all agricultural and animal-husbandry workers. The "average farmer" engages in a wide variety of agricultural activities, including dairy work, poultry husbandry, and other forms of animal husbandry, crop raising, orcharding, etc. While specialization in agricultural occupations is constantly increasing the great majority of agricultural workers must engage in general farm work.

The preparation of such persons must, therefore, cover a relatively wide range of agricultural activities. In many cases the failure of the small farmer is a direct result of his inability or unwillingness to combine several different but more or less supplementary phases of agricultural and animal-husbandry activities.

273. **Variation in agricultural activities.** While some of the elements entering into agricultural education in the secondary school remain relatively constant as far as geographical factors are concerned, other important elements must vary widely according to local conditions of soil, climate, topography, population distribution, and other factors. (1) Certain phases of agricultural and animal-husbandry occupations may legitimately receive special attention in States like Arizona where stock raising, etc., engages the activity of more than one quarter of those engaged in agricultural or animal-husbandry pursuits, in parts of California where more than eighteen per cent of all agricultural workers are engaged in horticulture, fruit-growing, nurseries, etc., on Long Island where the majority of farmers are engaged in truck-farming. (2) Special phases of agricultural pursuits may be emphasized according to soil and climatic or general topographical conditions; e.g., note the importance of dairy husbandry in southwestern Washington, of cattle and horse raising in central Washington, and of grain production in eastern Washington. The selection of certain kinds of agricultural education in the secondary school must be determined to some extent by predominant local agricultural occupations. The general principles governing such selection have been outlined in previous sections.

274. **The adaptation of "general" subjects.** As with other forms of vocational education there has developed a tendency to modify instruction in several "general" sub-

jects in the secondary-school program to the needs of special groups of pupils whose manifest destinies involve primarily agricultural occupations. For the most part such modification and adaptation has taken place in connection with the natural sciences, especially in connection with the biological sciences. The important basic bearing of the biological sciences on agriculture and the fact that the secondary-school population in rural communities tends to be roughly homogeneous as far as its vocational needs are concerned appear to give justification to the practice of directing the natural-science work for agricultural pupils along lines appropriate to the pursuit of agriculture and animal husbandry. As yet little attempt has been made to modify other "general" subjects for the purposes of agricultural education and the objections raised to "vocational English" and "vocational social science" in connection with clerical, commercial, and industrial education need not here be considered.

V. Domestic Subjects

275. Scope and field of domestic education. Under the general title of "domestic subjects" are here considered those subjects related to the various activities which have developed in the fields of housekeeping and homemaking. In this category fall such subjects as are commonly listed under the titles "household arts," "household sciences," and many "practical arts for girls" — covering the selection, purchase, preparation, and serving of food; the selection, purchase, preparation, and care of clothing; the selection, purchase, use, care, and arrangement of household apparatus; the care and training of little children, care for household sanitation and family health, etc.

As is the case with the practical arts in general those dealing with the home and family have been almost totally neglected in the secondary school until within the past few years and even at present receive very inadequate attention. Within the past decade or two domestic subjects covering a relatively wide range of domestic activities have been introduced in some of the larger secondary schools. In smaller schools the tendency has been to introduce elementary courses in cooking and sewing. In many secondary schools no domestic subject has yet found its way into the program of studies.

The late development of instruction in domestic subjects has not yet permitted the establishment of many stable policies and practices and domestic education must at present be considered as in its experimental and formative stage. No exact analysis of existing domestic subjects can be made where the materials, organization, and methods of teaching them differ widely in different schools.

276. Factors emphasizing domestic education. The primary factor emphasizing the importance of domestic arts in the program of the secondary school is, of course, recognition of the fact that the majority of girls will later be engaged predominantly in the activities of homemaking and housekeeping. It is true that in the past, even more than in the present, the home has been the sphere of woman's activity. Despite the fact, however, that women have to an ever-increasing extent engaged in activities outside the home, and in spite of the fact that many activities have been removed from the home, several factors have tended to emphasize the importance of secondary-school training in the domestic arts at the present time. Among those factors may be mentioned the following. (*a*) The education heretofore emphasized in the secondary school has to a considerable extent tended to guide the girl away from activities peculiar to the home. (*b*) Compulsory school-attendance laws and other factors have tended to bring more girls into the secondary school and to hold them there for a longer time. The secondary school has made such demands on the time and energy of girls that the amount of domestic training in the home has been noticeably curtailed. (*c*) Greatly extended opportunities for girls and women earning a livelihood in industry have decreased the amount of relatively cheap "hired help" in the home, thereby tending to some extent to offset the effect of labor-saving devices in the home and to increase the need for efficiency in domestic work. (*d*) Changed conditions of family life (e.g., the withdrawal of the mother from household work to factory work or other work outside the home) have in many cases rendered traditional methods of transmitting household arts from mother to daughter inadequate. (*e*) The modern scientific study of food values and nutrition of sanitation and hygiene has lent new meaning to household work. (*f*) The increased cost of many staple food commodities (especially meats) has emphasized the need for economical efficiency in the selection, purchase, and preparation of food. (*g*) The preparation of many articles of food and clothing outside the home has both simplified and complicated the economical and effective management of the household; e.g., note the dangers of adulterated food, the waste of shoddy clothing, deception in the sale of commodities, and the knowledge required to safeguard the family health and the family purse against such dangers. (*h*) The conditions of modern life, especially in the city and among foreigners, call for readjustments in home and family life that are fraught with danger unless guarded against. In this readjustment the secondary school must play its part.

277. Females in various occupations. According to the *Census Report* for 1910 there were 8,075,772 females ten years of age or over engaged in "gainful occupations" (i.e., not in their own homes). Of that number 637,086 were between ten and fifteen years of age, and 1,847,606 between sixteen and twenty years of age, leaving 5,591,086 females twenty-one years of age or over engaged in such occupations. These constituted 22.8 per cent of all females twenty-one years of age or older in 1910.[1] The remaining 18,964,668 women were for the most part engaged in occupations in their own homes. In addition a large proportion of those engaged in gainful occupations to some extent participated in domestic activities.

Analysis of figures presented in the census returns under the title of "domestic and personal service" is of relatively little value for the present purpose. Statistics there presented indicate that of women engaged in occupations thus classified were for the most part employed as servants (51.7 per cent), laundresses (23.6 per cent), housekeepers (professionally private, boarding and lodging 12.4 per cent) — total 87.7 per cent.[2] The total number engaged in those occupations (2,530,846 in all "domestic and personal service") is, however, relatively insignificant, when compared with the number engaged in domestic occupations in their own homes and excluded from the above-presented census returns. It is to be noted moreover that many phases of domestic activity are essentially the same whether carried on in the individual's own home or for hire in other situations, so that domestic arts education in the secondary school may prepare almost equally well for the majority of domesticities wherever involved.

278. Values of domestic education for girls. The chief activities of the great majority of women will always be found in the home. Even for the relatively small proportion of girls whose "profession" or "trade" will lie in activities outside the home, participation in some of the major activities of the home is inevitable, and the contingency is high that sooner or later every woman will be the central figure controlling the destinies of the home and family. For these reasons it is probable that some form and some amount of domestic education should constitute a part of the secondary education of all girls. Beyond doubt important responsibilities for homemaking must rest on the secondary-school boys who will later become partners in homemaking. It is, therefore, imperative that some preparation for such activities as are therein involved should be found in their education in the secondary school. Nevertheless it is probable that any attempt to enroll secondary-school boys in any specifically organized domestic subject would wreck itself on the reefs of antagonistic interests and attitudes. In all likelihood, therefore, such homemaking education as may profitably be provided for secondary-school boys must be provided in connection with civics, vocational arts, and possibly science and economics.

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[1] *Thirteenth Census Report* (1910), vol. IV, p. 73.

[2] *Ibid.*, p. 94.

PROBLEMS FOR FURTHER CONSIDERATION

1. Make a study of State provision for vocational education in America.
2. Compare provision for vocational education in America and in Germany, France, England, or Switzerland.
3. Investigate the attitude of labor organizations to vocational education.
4. In any high-school canvas the occupations of pupils' parents.
5. In any high-school canvas the vocational interests of pupils in various grades.
6. For any industry or part of an industry make an analysis of the knowledges and skills involved according to the length of time ordinarily required for their acquirement.
7. In any city examine the "working certificates" granted to boys and girls leaving school before the completion of the full period of compulsory attendance. What occupations do they enter?
8. Consider the pupils of any one "class" who entered the first year of the high school five or six years ago. Analyze the occupations which they have entered, classifying them according to the stage at which the different groups left school.
9. Make a study of existing apprentice systems in this country.

10. Make a study of the occupations found in a large department store. For which can the secondary school profitably provide vocational training?
11. Make a study of the costs of various forms of vocational and practical arts education in the secondary schools.
12. Make a study of present provisions for practical and vocational arts education in the secondary schools of any one State.
13. In any high school determine to what extent pupils leaving school either before or after graduation enter occupations closely related to vocational studies which they have taken in the secondary school.
14. What are the relative advantages and disadvantages of providing vocational studies in the secondary school itself and of providing for part-time vocational training in the occupation itself?
15. Debate this proposition: "Secondary education should be restricted to liberal studies because they can be provided nowhere else. Vocational training should not be provided in the secondary school because it can be secured better in the vocation itself."
16. To what extent do pupils' vocational interests change during the secondary-school course?
17. Discuss the possible effects of the Smith-Hughes Bill on secondary education in the United States.

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CHAPTER XVIII

THE PLACE OF ÆSTHETIC ARTS IN THE PROGRAM

I. General Considerations

279. Historical position in the program. The æsthetic arts as educational instruments occupied a position in primitive and early civilized society which modern educators can with difficulty realize. The best example of their use is found among the Athenians, in whose scheme of education the æsthetic arts were made the fundamental vehicles of intellectual, religious, moral, social, and physical training. Aristotle mentions four branches of education customarily afforded: reading and writing, gymnastic, music, and (sometimes) drawing or painting. Of these the first constituted but preliminary training and the last occupied a doubtful position, so that gymnastic and music (in the Greek sense) comprised by far the major part of Greek education. Thus Plato:[1]

> Education has two branches, — one of gymnastic, which is concerned with the body, and the other of music, which is designed for the improvement of the soul.
>
> The whole choral art is also in our view the whole of education and of this art, rhythms and harmonies, having to do with the voice, form a part. . . . And the movement of the body and the movement of the voice have a common form which is rhythm, but they differ, in that one is gesture, and the other song. . . . And the sound of the voice which reaches and educates the soul, we have ventured to term music. . . . And the movement of the body, which, when regarded as an amusement, we termed dancing; when pursued with a view to the improvement of the body, according to the rules of art, may be called gymnastic.

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[1] Plato, *The Laws*, Book VII and Book VI.

Gymnastic, in the Greek sense of the term, had as one of its chief purposes the æsthetic aim of developing harmony and grace of bodily movement: for the accomplishment of this end dancing was one of the principal educational means. Music, in the Greek sense of the term, included music in the modern sense (including vocal and instrumental music), poetry, the mimetic arts, and literature in general. In this connection it must be remembered that early Greek literature was almost exclusively poetic, that with the Greeks poetry was always related to music, and that poetry and song were the vehicles of social and religious traditions and ideals intimately connected with their life. The important fact to be noted is that music thus embodied racial ideals and traditions in a form which lent highly emotionalized value to the content. The Greeks, probably more than any other people, recognized the importance of emotional elements in determining the unconscious behavior of individuals and society. No race has ever made more effective use of the æsthetic arts as instruments of education. After the time of the Greeks the æsthetic arts practically disappeared from the program of education, not to reappear until the end of the eighteenth century or even later, and then as very inadequate educational instruments. The one exception to this statement is to be found at times in connection with the æsthetic side of literature.

In the Latin grammar school of the American colonies the æsthetic arts had no place, except in so far as they may have been related to literary study. Doubtless drawing and music first found their way into the American secondary school through the academy. Thus at least as early as 1837 drawing, vocal music, instrumental music, and architecture had been introduced into some academies in New York State. In some schools of uncertain status absurdly elaborate provision was made for æsthetic arts in the education of girls as indicated by the offerings of the Armston School of the late eighteenth century.

In the public high school drawing first made its appearance in the Girls' High School of Boston in 1826 when map-drawing and the principles of perspective were introduced. In 1829 "linear drawing" was made an elective subject in the English Classical (High) School of Boston. The development of drawing as a study in the public secondary school was of slow growth, however, until mechanical drawing received impetus through the manual training and technical high-school movement in the last quarter of the nineteenth century. Recently, the arts of form, design, and color have received constantly increasng attention both because of their relation to the industrial and household arts and because of increased recognition of their importance *per se.*

Doubtless vocal music of an informal character early was found in the public high school. Its first mention as a specific subject of study is found in the High School of Northampton, Massachusetts, in 1837, when nearly all girls in that school were reported to be engaged in its study. Throughout the nineteenth century its development was slow and sporadic, though eventually it was made a regular part of high-school work in the form of rather ineffective chorus work by the entire high-school pupil body once or twice a week in the majority of schools. Within recent years there has been manifest a distinct tendency to provide far more effective instruction in music in the public high schools and in some notable instances to provide instruction not only in vocal music but also in instrumental music.

On the whole, and with the possible exception of literature, instruction in the æsthetic arts throughout the nineteenth century was never effective as far as the secondary school was concerned. In mechanical drawing alone was effective instruction provided and there the emphasis was placed on that subject for its industrial and technical values primarily. The past decade, however, has given promise of distinct improvement.

280. Present status. The æsthetic arts at present are manifested in the American secondary school in connection with numerous subjects of study found in the program: music, literature, drawing, painting and design, manual arts, clothing arts, household arts, physical training — subjects ranging all the way from those in which the æsthetic element is dominant to those in which it may be subordinated almost entirely to other elements. Thus music has its place in the secondary-school program largely for its æsthetic values. Literature appears to share its values more evenly between the æsthetic and the social. Drawing, painting and other phases of design are on the borderline between æsthetic arts and practical arts, swinging now to one side now to the other according to the school and teacher. In manual arts, clothing arts, and household arts the purposes involved are dominantly utilitarian, the æsthetic element varying in prominence according to the materials employed and the teaching. Physical training is dominated by the conception of health values to which the æsthetic elements are subordinated.

It must be recognized, in spite of noteworthy exceptions in certain schools, that the American secondary school minimizes the æsthetic training of pupils, save possibly in connection with literature. Music, while regularly finding a place in the program of studies, is commonly limited to relatively ineffective group work in which the entire school body participates (theoretically) one or two periods per week. Few secondary schools in the country at present afford opportunity for effective training in music as one of the studies entitled to attention similar to that afforded other subjects of study. The arts of design (drawing, painting, etc.) at present manifest a tendency toward rapid development, especially in connection with industrial training and the practical arts. This development has not, however, taken place in the majority of smaller schools.

281. Fundamental principles involved. Two fundamental principles are involved in determining the values of the study of the æsthetic arts in the secondary school: (1) it must be recognized that the æsthetic arts represent the results of original tendencies of human nature to manifest its emotional states in satisfying form; (2) it must also be recognized that the results of the expression of such emotional states tend to spread similar emotions to others and thus to have social bearing.[1] Hence, as Dewey states:

> Viewed both psychologically and socially, the arts represent not luxuries and superfluities but fundamental forces of development.

By far the major portion of the secondary-school curriculum tends to emphasize the intellectual development and to neglect or to minimize the emotional development of the pupils. Such a situation cannot be justified as long as the emotions play such a prominent part in life as they do and should. The skeptic concerning the important part played by the æsthetic arts in modern life may well consider the erotic and dithyrambic music and song which attracts the secondary-school pupil and others, the character of modern dancing, the abundance of neurotic literature which is the common pabulum of secondary-school pupils in book and magazine, the character of the popular "musical comedy," and the blatant and gaudy magazine cover which passes for art. If interested in municipal affairs and community life, he may well compare conditions in communities where art is valued with those where art is decried or neglected. In America less than in most countries do the ordinary surroundings, apart from nature, afford stimuli to æsthetic appreciation and production. In America less than in most countries have traditions and ideals been perpetuated in æsthetic forms which might enhance their intrinsic value. In America more than in most countries should the school aim to do what the artificial environment does not — develop the æsthetic arts.

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[1] Cf. Dewey, J., pp. 579–80 of Monroe, P. (Editor), *Principles of Secondary Education.*

282. Values of the æsthetic arts. For the majority of pupils the basic values of the study of æsthetic arts in the secondary school are doubtless to be found in the contributions which that study may make to the individualistic-avocational aim of education — in the development of ability worthily to utilize leisure, properly to enjoy life, and to express personality. It must be recognized, however, that the æsthetic arts are so closely related to other fields of study and activity that it becomes impossible in most cases to separate them other than for purposes of analysis. The social and æsthetic elements are so closely interwoven in the study of literature that it is a serious mistake to attempt their dissociation. The æsthetic element separated from the content element of literature becomes a barren abstraction. Its content separated from the æsthetic element loses that emotional appeal which gives literature much of its impelling force in determining thought, attitude, and action. Thus too the æsthetic arts of design are so intricately involved in the industrial arts, in the clothing arts, and in the domestic arts that the two elements should not be dissociated. No sharp line of distinction can properly be drawn between the æsthetic arts and the practical arts. Any attempt to do so must result in great loss to both. In physical exercise also we are beginning to realize that the æsthetic has its place. The schoolboy and the bleacherite recognize and appreciate "form" in athletics and, especially for girls, dancing has begun to find a recognized place in physical exercise.

It is, of course, a fact that every subject of study and most major activities of life in which the secondary-school pupil is likely later to engage involve some elements of æsthetics and have their emotional sides. Failure to develop those elements is a pedagogical error affecting secondary education to-day.

II. LITERATURE

283. Æsthetic art and literature. By far the most commonly and most extensively studied æsthetic art in the secondary-school program is literature. In Chapter XII the values of the study of literature were considered with particular reference to content values. It was there suggested that the fundamental values of the study arose from its contribution to the social-civic aim and the individualistic aim of secondary education. In particular it was suggested that through the study of literature the pupil is brought into contact (vicariously) with human experiences and human conduct, and becomes acquainted with the facts, traditions, and ideals of society. Such contact and acquaintance cannot but affect vitally the life of the pupil. It is through the emotional factor which makes literature, however, that those facts, traditions, and ideals, which form the content of the study, take on a large part of their impelling power. It was further suggested that the integrating function of secondary education was aided by the study of literature through the arousal of common ideals and tendencies to act. Here again it is the æsthetic element which enhances those ideals and tendencies to act by adding emotional value. Finally it was suggested that the study of literature contributed to the ability worthily to enjoy leisure by establishing standards and tastes in reading and by increasing the pupil's ability to enjoy good literature. This means nothing more or less than training in æsthetic appreciation. In so far as the development of ability to create literature or even to express one's self well is affected by the study of literature, æsthetic art on the expressive side is created.

The æsthetic element in literature naturally finds its greatest strength in poetry. Content elements doubtless must always be the primary factors determining the selection of materials in prose literature, the æsthetic elements being a secondary consideration. In poetry, however, the æsthetic elements should equal or transcend the content elements as controlling factors determining the selection of materials.

III. MUSIC

284. Present status of the study of music. At the present time some instruction in music is probably provided in every public secondary school. In the vast majority of cases, however, such instruction is restricted to one or two periods of chorus work which is frequently of a useless or worse than useless character — worse than useless in many instances because it arouses a positive distaste for the study of music and an opposition to the ineffective work which is attempted. According to the Report of the Commissioner of Education for the school year 1914–15 pupils were engaged in the study of vocal music as indicated in the following table:

TABLE CXLIX *

	Number	*Per cent of all pupils*
Public High Schools	367,188	31.50
Private High Schools	47,467	37.76
All Secondary Schools	415,655	32.19

* *Report of the United States Commissioner of Education* (1916), vol. II, pp. 487–89.

These figures are difficult to interpret properly, since in all probability they include in part figures for pupils who engage merely in certain general chorus work and in part pupils taking special elective courses in technical music. For pupils engaged in such courses and in courses in instrumental music no figures are available. Nor can any reliable estimate be made of the educational results of such music instruction as is sometimes provided through the organization of extra-curriculum orchestras, voluntary choruses, and musical clubs.

285. **The social-civic values of music.** The study of music is not ordinarily conceived as possessing social-civic values. Nevertheless the social value of the study of music is not to be overlooked. It should be recognized that social attitudes and actions are not controlled exclusively by activity of the intellect and that emotional factors play no unimportant part in the determination of attitudes and actions. Through the enjoyment of music may be developed emotional tones in the individual or group which powerfully affect attitudes toward every form of activity, social, civic, vocational, and personal. Hence the importance of music in military affairs, in the church, in school group activities, and in general wherever large groups of people are assembled for common activity. For the development of common emotional attitudes in groups united for any purpose few instruments can compete with music. For example, the singing of the "Marseillaise," of the "Wacht am Rhein," of the "Star-Spangled Banner," of "God Save the King," may serve a social-civic purpose where any amount of reasoning might prove relatively ineffective. As one of the commonest forms of group activity for the utilization of leisure, music also serves a distinct social purpose. As long as music continues to be a carrier of common sentiment and ideals, it must continue to have social-civic values.

286. **Economic-vocational values of music.** The voca-

tional values of the study of music have been strangely overlooked in the secondary school. The number of persons engaged in the musical profession is by no means negligible from the viewpoint of vocational education. In this connection it is to be noted that, whereas in most general fields of vocational activity a relatively small amount of elementary facts, principles, and processes is common to the various subdivisions of occupations classified under one general head, in the field of music there is a common foundation of technical knowledge underlying all the special subdivisions of the general field. Hence, there exists a considerable body of musical education which may be of definite vocational value to individuals engaging in the several branches of the musical profession.[1]

287. **Individualistic-avocational values of music.** For the majority of pupils in the secondary school the primary values of the study of music must be found in the contributions which it makes to the individualistic-avocational aim of secondary education — the preparation of the individual worthily to enjoy his leisure, assimilate the musical inheritance of society, and develop the expression of his own personality in ways which are not designed primarily for the attainment of social-civic or economic-vocational efficiency. As one of the important means for the utilization of leisure, for the expression of certain forms of personal feeling, as an instrument deeply affecting emotional tones of the individual and of groups, as an art closely linked up with poetry, song, drama, the dance, and other forms of æsthetic expression — as involving all these elements music deserves far greater attention in the secondary school than it now receives in most instances.

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[1] According to the *Thirteenth Census Report* (1910), vol. IV, p. 93, the number of people engaged primarily as musicians and teachers of music was: total, 139,310; male, 54,832; female, 84,478.

288. **Three groups of pupils to be considered.** In a rough classification pupils in the secondary school may be divided into three general groups: (1) those who possess distinct interest and capacity in musical *accomplishment*; (2) those who possess distinct interest and capacity in musical *appreciation* but only a moderate interest or capacity for musical accomplishment; (3) those who possess no interest or capacity in musical accomplishment and only a moderate interest or capacity for musical appreciation. Obviously no line of clear distinction can be drawn between group (2) and group (1) or (3). In fact it is to be hoped and expected that in their progress through the school many pupils will pass from group (2) to group (1) and from group (3) to group (2).

289. **Courses emphasizing musical accomplishment.** Attention has been called above to the fact that an appreciable number of secondary-school pupils are destined to become professional musicians. Many others are destined to become part-time musicians and more or less skilled amateurs. The number of pupils thus classified in any school may to some degree be reckoned from the number of pupils who now "take private music lessons" outside the school. In the majority of schools at the present time this group is remarkably large. Proper attention should be given to this group either in the school program or through coöperation with instructors now providing private tuition. In the school itself should be offered for this group at least courses in musical theory and, as far as may be practicable, courses in practice, including chorus singing, glee-club work, orchestra, and applied music both vocal and instrumental. Such courses should, of course, involve intensive study with emphasis on technical knowledge, skill, and accomplishment, with a tendency, in some cases pronounced, toward emphasis on vocational ends.

290. **Courses emphasizing musical appreciation.** Many persons have a distinct interest in and capacity for musical appreciation without marked interest in or capacity for musical accomplishment. They do not desire to become professional performers or even skilled amateurs, though they do desire to have extended opportunity for musical appreciation and a theoretical knowledge of music. For such pupils courses should be provided in chorus singing, glee-club work, music appreciation, and musical theory. In such courses technique may be reduced to a minimum necessary for proper appreciation and the vocational purpose should be eliminated. It should be recognized, however, that the transition of many pupils from this group to the group of those who desire to study music for vocational purposes or with the intention of becoming skilled amateurs is to be expected.

291. **Courses for other pupils.** After the two groups of pupils above mentioned have been provided for there remains the heterogeneous group of other pupils in the school whose musical interests and capacities range all the way from a real or imaginary opposition to music, through indifference, to a moderate degree of interest in and capacity for musical appreciation. For this group it should be recognized that musical instruction, in so far as it is at all proper, must be based on the development of musical appreciation. In most schools at the present time the only provision made for this group (as indeed for all groups mentioned) is general chorus singing. It is probable that for many pupils in this group, particularly the boys, no surer means could be devised to create a distaste for musical *instruction* than the requirement of chorus singing. Æsthetic appreciation, being of an emotional character primarily, is not readily susceptible to development under compulsion. This should be frankly recognized in the organization of courses in music for this

group of pupils. It is probable that the utilization of mechanical musical instruments (player pianos, etc.), together with performances by skilled musicians, would accomplish much more to develop some degree of musical appreciation by many pupils who now openly or silently rebel against the requirement of participation in chorus singing. This means that chorus singing should be made elective rather than required in the secondary school, but that opportunity be afforded to all pupils to listen to good music.

III. Design and Related Arts

292. The field of design and related arts. By design and related arts are meant here those æsthetic arts which have to do with the manipulation of materials in space, form, and color, and represent æsthetic expression in the felicitous harmony of spacial or color relations. Included under this head, therefore, are drawing, painting, modeling, the æsthetic side of construction in wood, metal, textiles, or other material, color selection and arrangement in cloth or other material, and such arrangement of materials or objects as may be involved in decoration. At the one extreme is found "art for art's sake" and at the other extreme is found art almost completely subordinated to the utilitarian demand. Until recently drawing (occasionally supplemented by color work) was the sole representative of these arts in the secondary school. Only with the present tendency to develop applied arts in the direction of industrial and household arts were conditions created favorable for the interrelation of practical and æsthetic arts so that the materials dealt with might satisfy both utilitarian and æsthetic demands.

293. Two broad divisions of art instruction. As affecting instruction in art in the secondary school it is helpful to make two broad divisions of the field: (1) art instruction which concerns itself primarily with the appreciation (and to a slight extent possibly with the expression) of art not related to definite utilitarian ends; (2) art instruction which is definitely and purposely related to practical ends. The first of these two divisions is designed primarily to develop an appreciation of beauty in nature and the artificial environment, to satisfy the inherent love for the beautiful as a part of the development of personality, and to enable the individual to receive the spiritual inheritance of the race as expressed in art. This means courses in the school designed primarily to develop in pupils appreciation without reference to artistic technique beyond the elements requisite for proper appreciation. In such courses are appropriate only such principles of space, form, and color harmony, of perspective, composition, design, and such artistic ideals as are suitable for the proper appreciation and enjoyment of art products by the average individual who will not engage in activities involving artistic accomplishment. The second of the two divisions of art instruction is designed definitely to lead toward some form of artistic production, especially in relation to industrial, commercial, and household arts. Some of its more important phases are considered in the following sections.

294. **Design and related arts as related to industrial arts.** Three conceptions emphasize the importance of relating æsthetic art to the industrial arts: (1) that life may be made more pleasant and therefore more efficient when ordinary artificial objects which surround us are agreeable to the senses and lend favorable emotional tones to daily life; (2) that æsthetic qualities attached to created objects add actual commercial values to the industrial product; (3) that the distinction between craftmanship and workmanship, between the artisan and the laborer, is largely dependent on

the presence of the æsthetic element as an impelling factor in industrial production. Concerning the first and second of these conceptions little need be said here. Experience in the home and in the industrial or commercial world have shown clearly that actual efficiency is increased under more pleasant surroundings. Experience has also shown that of two industrial products equal in other respects that which is more pleasing to the senses will be chosen by the purchaser.

The third conception mentioned above deserves more extended comment. The development of the factory system and of standardized production has all but destroyed individualism in the character of many industrial products and has almost eliminated the craftsmanship of earlier days. Three results are to be noted: (1) the industrial worker lost a large part of that stimulus and opportunity to contrive, invent, and create — to express his personality in the results of his work — which means so much on the side of interest, pleasure, and ultimately efficiency in labor; (2) industry lost something which can result only when the worker is interested in and enjoys his labor; (3) the user of industrial products lost much which might add to enjoyment in utilizing the products of industrial labor. Industrial conditions are not likely to be reversed but rather to go farther in the direction which they have taken. Nevertheless the infusion of æsthetic ideals into the industrial arts can do much to ameliorate existing conditions.

It is, of course, needless to enumerate the more directly utilitarian applications of the æsthetic arts in industrial occupations, such as mechanical and architectural drawing, design and color harmony in textile work, wall-paper, and the like, or the various applications of art design in metal and wood work. It needs only to be pointed out that the values of design and related arts are directly vocational for certain vocational groups in the secondary school whose later occupations may be in the field of industry.

295. Design and related arts as related to commercial arts. As long as the commercial arts in the secondary school were limited to the clerical arts of bookkeeping, stenography, typewriting, and the like, the æsthetic arts could be considered as having no contact with commercial educatio in the school. However, with the growing conception tha commercial education in the secondary school should be extended to cover salesmanship and other phases of merchandising and store service, a much wider field is opened up for the application of the æsthetic arts of design and its relatives. Thus, in practically all commercial enterprises advertising opens up opportunities for art. In retail stores window display, interior decoration, and counter display become effective fields for the union of æsthetic art with business. Finally, in all stores which deal in clothing and textiles, furniture, or personal and household furnishings, elements of color harmony and design become important to officers, salesmen, and saleswomen. Actual efficiency of commercial value is here contributed by applied elements of æsthetic training of boys and girls who join the vast army of commercial workers and come into direct contact with the purchaser of articles, no small part of whose value and appeal arise from æsthetic considerations.

296. Design and related arts as related to domestic arts. In the expansion of the practical-arts program for girls in the secondary school a large and important field has been opened up for applied forms of design and its related arts. This is, of course, particularly true in connection with those arts which have to do with the selection of household equipment, even the house itself, the arrangement of household equipment, its care and service, and in the clothing arts. The physical environment of the home is one primary source of happiness or unhappiness, of good or bad character, of good or bad health, of economic efficiency or inefficiency — we may even say that it is in many cases the basis of successful or unsuccessful home life. Finally, it is the environment in which individuals in the earlier part of their lives must live and from which the first standards of æsthetic feeling must come. All these considerations suggest the importance of a development of æsthetic appreciation and expression on the part of girls who must later become home-makers and who will to a large extent determine the character of the home surroundings and the character of coming generations.

Of great importance also is the development of æsthetic appreciation and expression in clothing and dress. Instruction in costume design and color harmony can do much not only to affect the enjoyment of life, but also to aid the family pocketbook and to offset the absurd dictates of fickle, sometimes even wasteful or indecent, "fashion." Unless history reverses itself dress will always play an important part in the youth and early adult life of the girl and woman (or boy or man). In meeting the needs of dress the practical, economical, physiological, moral, and æsthetic combine. Habits of dress have much to do with the character and life of the individual. No second Teufelsdröckh is needed to emphasize the philosophy of women's clothes.

PROBLEMS FOR FURTHER CONSIDERATION

1. In any secondary school make a survey designed to ascertain: (*a*) what pupils receive or have received musical instruction under private tuition, with classifications according to length of instruction, number of lessons per week or month, kind of instrument on which instruction is received, etc.; (*b*) what pupils live in homes where muscial instruments are owned and played; (*c*) what pupils live in homes where mechanical musical instruments are owned; etc.
2. In any secondary school make a survey of the musical compositions, songs, etc., which are most popular, copies of which are owned, o

"records" of which are owned in the home. Do not neglect the "words" side of the songs!

3. In any city ascertain the number of persons whose sole occupation is music and the number of those who devote a part of their time to the musical profession for remuneration. (For large cities use the census returns.)
4. Outline the arguments for and against the requirement of some study of music by all pupils in the junior high school grades; in the first year of the four-grade high school.
5. Outline the relative advantages and disadvantages of private instruction and school instruction in music.
6. Compare the values of private and school instruction in the various forms of graphic and plastic arts.
7. To what extent can justification be found for the requirement of study in drawing in the junior high school by all pupils? What objections could be raised?
8. Discuss the claim that drawing should be made a required study in the secondary school on the basis of its tool uses as a universal language.
9. What are some of the specific elements of art instruction which may be considered of importance in the education of secondary-school girls?
10. Discuss this statement: "The (art) work (in the high school) simplifies itself, however, into the single purpose of training the pupil to perfect his apperceptive faculties."
11. Discuss Spencer's theory: "Accomplishments, the fine arts, *belles-lettres*, and all those things which, as we say, constitute the efflorescence of civilization, should be wholly subordinate to that knowledge and discipline in which civilization rests. *As they occupy the leisure part of life, so should they occupy the leisure part of Education.*"
12. Discuss Dewey's theory that æsthetic expression precedes æsthetic appreciation. (Cf. page 590 of Monroe, P., *Principles of Secondary Education.*)

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Cf. also references for Industrial Education, Domestic-Arts Education and Manual Training at close of chapter XVII.

CHAPTER XIX

PHYSICAL EDUCATION IN THE SECONDARY SCHOOL

I. Physical Education

297. Historical development. The ancient Greeks alone of all peoples in civilized society adequately recognized the importance of physical education and made proper provision therefor. After their time physical training as a formally organized part of the work of secondary education practically disappeared from the school until about the beginning of the nineteenth century. In the Latin grammar school of the American colonies no provision was made for physical education nor was any provision made for that phase of education in the early academies. After the establishment of the United States Military Academy at West Point in 1802 military training was introducted into many academies and even into a few public schools. About 1825 German gymnastics were introduced into some secondary schools, but that movement soon gave way to the early (Fellenberg) manual labor movement. The Civil War directed attention again toward military training but this again was supplanted by formal gymnastics in the eighties and nineties, gymnasiums were established in high schools, and gymnasium work remained the principal form of physical training in secondary schools until the modern movement toward physical training through games tended in part to take the place of formal gymnastics.

298. Present status. Physical education in the secondary schools of this country at the present time ranges all the way from the zero point to a very high degree of effective provision. Some conception of the situation as it existed in 1910 may be seen from the following table:

TABLE CL. PHYSICAL EDUCATION IN 2392 PUBLIC HIGH SCHOOLS *

Schools	*Number*	*Per cent*
Having a general department of physical education	109	4.6
Having a teacher in charge of department	104	4.3
Giving regular instruction in hygiene	372	15.6
Work in hygiene prescribed	255	10.7
Giving credit for work in hygiene	183	7.6
Giving instruction in gymnastics	188	7.9
Work in gymnastics prescribed	114	6.0
Giving credit for work in gymnastics	79	3.3
Giving instruction (?) in athletics	232	9.7
Work in athletics prescribed	28	1.2
Giving credit for work in athletics	15	0.6
Giving instruction in swimming	6	0.2
Having medical examination of students	139	5.8
Having sanitary inspection by physician	284	11.8
Having swimming pools	9	0.3
Having gymnasiums	175	7.3
Having military drill	34	1.4
Having athletic fields	469	19.6
Having tennis courts	339	14.2

* Compiled and arranged from data given by the Committee on Status of Instruction in Hygiene in American Educational Institutions, *Proceedings of the Fourth Congress of the American School Hygiene Association*, pp. 174–75. Also pp. 453–54, *American Physical Education Review*, vol. xv.

While conditions have improved noticeably since 1910, it remains true that woefully inadequate provisions are made for physical education in the public secondary schools at the present day. In the great majority of public secondary schools little or no provision is made for gymnasiums, no qualified teacher is employed for physical training or even for the teaching of hygiene, athletics are supervised and directed by teachers with few or no qualifications, no adequate machinery is provided for physical examination or even for medical inspection, and what little physical training is given is of a formal and perfunctory character. The common provision, even in some of our best schools, of two periods per week in gymnasium exercises, is little more than a pretence of education.

299. The values of physical education. The values of physical education in the secondary school are universally recognized in theory and almost universally ignored in practice. Vital efficiency must always underlie and condition all other forms of efficiency — social, economic, and personal. This fact is readily recognized but its implications are seldom sufficiently understood. A few salient features may serve to emphasize those implications.

(1) The annual death-rate for the United States is estimated to be between fifteen and eighteen per thousand of population. Between one and a half and two per cent of our total population dies each year and the median age of death is approximately thirty-eight. It is estimated that approximately two fifths of those deaths could be postponed by the application in a reasonable way and to a reasonable extent of knowledge now available.[1]

(2) It is estimated that in the United States there are constantly about three million persons on the sick list. The application of available health knowledge in a reasonable way and to a reasonable extent could probably reduce this number by fully one half.[1]

(3) The economic loss to society each year through deaths which could have been postponed is probably more than a billion and a third dollars. The loss of earnings annually on the score of preventable illness is probably more than a half billion dollars. When there is added to these figures the cost of medical care for the sick which might with reasonable precautions have been avoided, the total annual loss for the country is estimated at over two billion dollars — over one hundred dollars for each family in the country.[1]

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[1] Based on data collected from several sources by Rapeer, L. W., *School Health Administration*, pp. 17–27.

(4) The physical and mental suffering caused by ill health and death cannot, of course, be estimated. Its extent may be judged in part from the figures above presented. The important fact to be noted is that much of that suffering might be prevented if proper precautions were taken.

It is obviously true that the prevention of premature death and of many illnesses must depend on the physician's skill to a large extent. It is also true, however, that much depends on: (*a*) the development of a greater degree of resistance to disease through the improvement of bodily health; (*b*) the dissemination of available health knowledge and the development of health habits. Here the responsibility rests on the school for physical education in hygiene and physiology and for physical training. In both fields the secondary school must play its part.

300. Factors emphasizing physical education. Physical education has always had important claims for attention in the secondary school. However, numerous factors have combined to emphasize its importance at the present time. Among those factors may be mentioned the following:

(1) The past quarter of a century has seen tremendous strides taken in the advance of preventive medicine as related to hygiene and sanitation. Much of that advance consists in the accumulation of relatively simple health knowledges which need but to be known and understood to reduce greatly illnesses and death or to improve the physical efficiency of the individual and the race. The dissemination of those health knowledges and the development of habits of life in accordance therewith is an important function of the school. Much of this may readily be done in the elementary school. Much is appropriate to secondary education.

(2) Recent developments in health knowledge have emphasized the importance of coöperation in community hygiene and sanitation. It is probable that children in the

elementary school are not mature enough in their social consciousness to grasp adequately principles and problems of this phase of physical education and that the major part of responsibility for it must rest on the secondary school. It may be noted that this phase of physical education merges with civic education and in part may be provided for in connection with community civics.

(3) Changes in American life within recent years have tended to diminish the stimuli and opportunities for physical exercise and training. Among the most important factors here involved may be noted: (*a*) the tendency toward life in the city and away from life in the country has served to lessen the stimuli and opportunities for physical activity both in work and in play; (*b*) not many generations ago the major part of work was done by men and women, boys and girls. At present the major part of work is done by machinery. The loss in physical activity by the worker has been great. Even where "hand work" is still important it tends to be limited to a single series of specialized movements; (*c*) sedentary occupations have tended to increase greatly; (*d*) within recent years "sedentary" amusements have tended to supplant amusements involving physical activity and to be confined to indoor instead of out-of-door amusements.

(4) In part as a result of certain factors mentioned above, in part for other reasons, it has been claimed that, while zymotic diseases have been greatly decreased by developments in preventive medicine, certain organic diseases and diseases of the nervous system have greatly increased.[1] Here the facts are by no means clear, since it is difficult to ascertain whether the figures represent a real increase or only an apparent increase due to improvements in methods of

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[1] Corwin, R. W., *Proceedings of the National Education Association* (1913), pp. 419–20.

diagnosis and increased attention to nervous diseases. The factor mentioned below may, however, affect the situation.

(5) Through improved methods of preventive and remedial medicine many persons are now preserved to maturity who previously would have died at an early age. In many cases they have constitutions which require careful attention if they are to be protected from disease. The secondary school must do its share in providing them with physical education.

301. Three general divisions of physical education. Three general divisions of physical education may be distinguished in the secondary school: (1) instruction in physiology and hygiene; (2) physical training provided as a regular part of the school work; (3) athletics and play. In making this distinction it is not intended to imply that work in the various fields mentioned is or should be entirely dissociated. The sole purpose in making the distinction is to consider the special values and aims of the three phases of physical education. In the work of the secondary school they should be as closely associated as possible. The position will be taken in a later section that athletics and play should be a regular part of the organized and directed physical training. The position will also be taken that the effective administration of physical education can be carried out only when there exists adequate machinery for medical inspection and health supervision.

302. Physiology and hygiene: past and present status. The study of physiology and hygiene in the public schools had its beginning in the third decade of the nineteenth century and its development was rapid after 1850. Its greatest impetus, however, came as a result of the "temperance" movement of the last quarter of the nineteenth century. By the beginning of the present century nearly all States had made legal provision requiring the teaching of physiology and hygiene with "special instruction as to the effect of alcoholic drinks and of stimulants and narcotics on the human system." Much of that instruction was provided in the grades of the elementary school, but the study of physiology and hygiene also had its place in the secondary school. Data concerning the study of the subject in the public high schools from 1895 to 1915 are presented in the following table:

TABLE CLI. PUBLIC HIGH-SCHOOL PUPILS ENGAGED IN THE STUDY OF PHYSIOLOGY, 1895–1915 *

Year	*Number*	*Per cent*
1895	104,862	29.95
1900	142,401	27.42
1905	149,262	21.96
1910	113,252	15.32
1915	110,541	9.48

* *Report of the United States Commissioner of Education* (1916), vol. II, p. 487.

On the whole it may be said that up to recent date instruction in physiology and hygiene both in the elementary school and in the secondary school has been a conspicuous failure, though reforms of the past decade give promise of betterment. For this failure it is not difficult to find reasons: (*a*) the study was inaugurated in the schools as part of a propaganda and became preaching rather than instruction; (*b*) teachers were either apathetic and merely conformed to the letter of the law or were reformers whose enthusiasm led to well-meant but ignorant teaching; (*c*) as far as temperance instruction was concerned much that was taught was demonstrably false and obviously untrue even in the knowledge of the pupils, while much more was not demonstrably true; (*d*) apart from the temperance propaganda the physiology which was taught, especially in the high school, concerned itself with anatomy and scientific classification of parts and organs of the body rather than with the application of hygiene knowledge; (*e*) textbooks in physiology until within recent years were most unsatisfactory, either tending to exaggeration and falsity when designed as a part of temperance propaganda or tending toward too much scientific classification and organization and neglecting practical hygiene.

Within the past few years and especially in the high school there has developed a tendency to provide instruction in physiology and hygiene not only through courses in that subject proper, but also in connection with biology, general science, domestic science, and community civics. Further, textbooks in the subject and methods of teaching have been adapted to the real ends of instruction in physiology and hygiene — the imparting of health knowledge and the development of health habits which will have practical and fairly general application in the lives of the pupils.

303. Place of physiology and hygiene in the program. It must be recognized that instruction in physiology and hygiene has its legitimate and necessary place in the school. Some of that instruction is and should be provided in the elementary school throughout its course (grades one to six). Before entrance to the junior high school the pupil should have acquired considerable physiological and hygienical knowledge. Instruction in those fields should be continued throughout the junior high school. In the seventh grade (first grade of the junior high school) that instruction may well be given as a separate study. In the eighth and ninth grades (second and third grades of the junior high school) it may be made a part of the general science courses. In the ninth grade also it should be related to the course in community civics. Throughout the junior high school all instruction in physiology and hygiene should be conducted primarily from the viewpoint of its application to the lives of the pupils and to social needs. The study of physiology and hygiene as a science has no place in the junior high school. As a science physiology and hygiene should be reserved for study as elective in the senior high school. Recognition of the phenomena of retardation and elimination should guard us against the suggestion made by some that a high-school course in physiology and hygiene (to be engaged in by all pupils) should be deferred until the pupil may have studied biology, chemistry and physics.[1]

304. Direct importance of physiology and hygiene. There is no possible way of determining exactly the importance of some knowledge of physiology and hygiene to the secondary-school pupil during the school period of his life. A few facts are worthy of attention, however, in that connection.

(1) In 1914–15 the United States Commissioner of Education reports that 585 cities in the country having each a population of 10,000 or over had a total enrollment of 643,957 high-school pupils with an average daily attendance of 540,603.[2] So many factors affect attendance or non-attendance that it is impossible to determine the amount of absence from high school that is due to illness or to estimate the effect of poor attendance on the pupil's work, retardation, and sometimes elimination. It is known, however, that one of the most potent causes of retardation, even in high-school pupils, is irregular attendance.[3] The amount of non-attendance due to illness or poor health is greater than is sometimes thought. This may in part be remedied by proper health inspection and attention, in part by the dissemination of health knowledge and the development of health habits among high-school pupils.

(2) Careful investigation of the physical conditions of

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[1] Cf. Berry, C. S., p. 357 of Johnston, C. H. (Editor), *High School Education.*

[2] *Report of United States Commissioner of Education* (1916), vol. II, p. 47.

[3] Cf. Ayres, L. P., "The Relation Between Physical Defects and School Progress," *Proceedings of the Fourth Congress of the American School Hygiene Association*, pp. 99–105; Rapeer, L. W., *School Health Administration*, pp. 31–50.

secondary-school pupils has indicated that more than one half of the high-school pupils suffer from more or less serious physical defects.[1] While the correction of many of those defects demands the care of the specialist the health instruction of the school can at least impress on the pupils the recognition of their defects and the importance of immediate attention to their correction.

(3) Children of secondary-school age in alarming numbers suffer from preventable diseases. Some conception of the importance of this factor may be gained from figures presented in the following table.[2]

TABLE CLII. ESTIMATED PREVENTABILITY OF DEATHS OF CHILDREN OF AGES FIFTEEN TO NINETEEN FOR TEN MOST NUMEROUS CAUSES OF DEATH IN 1910

Causes of deaths	*Total number of deaths in United States*	*Per cent preventable*	*Number preventable*
Pulmonary tuberculosis	8650	75	6487
Accidents and undefined	4230	?	?
Typhoid fever	2830	85	2405
Heart disease, organic	1940	25	485
Pneumonia	1920	45	864
Tuberculosis, other parts	1750	75	1177
Appendicitis	1270	50	635
Bright's disease	740	40	286
Suicide	550	?	?
Meningitis	500	70	350

These and other considerations render imperative and effective program of health instruction, inspection, and care in the secondary school.

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[1] Small, W. S., pp. 500–03 of Rapeer, L. W. (Editor), *Educational Hygiene.*

[2] Arranged from data given by Rapeer, L. W., *School Health Administration,* p. 17. Cf. Department of Commerce, Bureau of the Census. *Mortality Statistics* (1911).

305. Sex hygiene and sex pedagogy. Modern civilization is in many points in direct conflict with nature; nowhere is it in greater conflict than in matters related to sex. Modern conventions and the conditions of modern life make necessary and desirable the postponement of marriage until a date considerably later than the development of strong sex instincts and the maturity of physiological functions related to sex. Sex maturity begins to appear during the period of secondary education, and the development of sex instincts during that period is as inevitable as the daily rising of the sun. Sex indulgence, normal and perverted, among secondary-school pupils is by no means the rare exception that trusting and optimistic school authorities would believe. For every case that becomes known there are many cases which remain undiscovered.

The importance of measures which may help to diminish the ravages of venereal diseases in society need not here be rehearsed. The prevalence of such diseases and their effects have been discussed *ad nauseam* in modern literature, both scientific and unscientific. The problems of education in this connection are not those of need, but rather of ways and means. According to Crampton:[1]

> The problem resolves itself into two parts:
> 1st. Shall instruction in sex hygiene be given in the schools?
> 2d. When, how, and by whom shall it be given?
>
> The situation is bristling with difficulties. It may be questioned whether knowledge is more protective than ignorance, and the answer may be that knowledge from a worthy source is better than that which comes from vicious companions.
>
> It may be firmly held that this instruction should come from the father and mother, the physician or other sources; to this the reply must be given that these sources are ineffective, for the situation still demands a remedy.

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[1] Crampton, C. W., "The Teaching of Hygiene," *Proceedings of the Fourth Congress of the American School Hygiene Association*, pp. 137–42.

> It is a question whether this instruction should begin before or after puberty, in the elementary school or the high school.[1] Whether it should be taught in the department of biology, hygiene, physical training, or in an entirely separate department, is still to be determined.
>
> The advantages of the lecture method as against the individual conference, the systematic as against the occasional presentation, are all to be considered.
>
> Whatever course may be followed it is safe to say that it should be based upon the relation of the sex hygiene to *health*, rather than its relation to ethics or religion.

The answer to the first problem raised by Crampton should be unqualifiably affirmative. Education in sex hygiene must be given in the schools. The legitimate place for that education is at the point where it has its greatest application, namely, when the sex instincts begin to mature. The school is the only agency which society may systematically control for purposes of this education.

To the second problem raised by Crampton no final answer can be given on the basis of available knowledge. Much may be done in the departments of biology, physiology, hygiene, physical training, and civics. Much may also be done in the administration of the school activities, particularly in connection with the extra-curriculum activities, social and athletic. Crampton quotes Governor Whitman (formerly District Attorney for New York City) to the effect

> that athletics have done and would do more to wipe out the "white slave" traffic than the passage of any or all of the legislation now pending in Washington or Albany.[2]

306. Past and present status of physical training. In the American secondary school physical training through bodily activity has at various times and to varying extent followed four principal lines of development: (1) military drill; (2) " manual labor " and " manual training "; (3) formal gymnastic exercises; (4) athletic exercises and games. Military drill was found in some of the Latin grammar schools. Military or semi-military academies and private schools have been more or less prominent from the beginning of the nineteenth century. The Civil War, the Spanish War, and the present World War, each gave at least temporary impetus to military training both in private and public secondary schools. The early manual labor movement laid emphasis on " practical " physical activity and the element of physical training was emphasized in the manual training movement of the last quarter of the nineteenth century. Formal gymnastics found a place in the secondary school of the second quarter of the nineteenth century for a short time and were prominent periodically until they secured a firm position in the schools in the last quarter of the nineteenth century. Athletics and games developed extensively but informally during the last quarter of the nineteenth century. Their incorporation into the secondary school as an integral part of its work and their extensive substitution for formal gymnastic exercises have been developments of recent years.

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[1] The organization of the six-three-three school system affects this problem.

[2] Crampton, C. W., "The Teaching of Hygiene," *Proceedings of the Fourth Congress of the American School Hygiene Association*, p. 141.

In Table CLI some incomplete data were presented concerning physical training in the secondary schools. They show that the problem of physical training through exercise as yet has not been adequately recognized, much less solved.

307. Values and aims of physical training. In general the values and aims of physical training through motor activity are *per se* the values and aims of all physical education. In particular physical training through motor activity aims to improve bodily health and efficiency by giving exercise to those parts of the body which fundamentally condition health and vigor, by developing muscular and neural coördination, by establishing habits of healthful exercise, and, in some cases, by correcting certain physical defects. Physical training through motor activity *as such* concerns bodily health and efficiency alone. However, the greatest error in physical training instruction in the past has been the tendency (common e.g., in formal calisthenics and gymnastics) to isolate that phase of education both from instruction in hygiene and also from the mental, social, and moral education with which it should be associated. The result was a form of physical education highly artificial, lacking in attraction to the pupil, and in the majority of schools very ineffective. On the other hand, when the course in physical training is properly combined with other phases of education, especially as the combination is found in games and athletics, few courses in the secondary school can compete with physical training as an educative force at once physical, social, and moral, and few courses can so readily stimulate the interest and endeavor of the pupils. This point is considered at greater length in following sections.

308. **Gymnastics in the program.** In the German higher schools formal gymnastics are judged to be a conspicuous success. In the American secondary school they cannot be considered otherwise than as a conspicuous failure. That failure has been due in part to the fact that very inadequate provision was made in many schools and that teachers are not well trained for such instruction. More important, however, at least as far as the future is concerned, are the objections which may be raised against reliance on formal gymnastics as the sole or principal means of physical training: (1) they are highly artificial and do not correspond closely to the normal motor activities in life; (2) they are purely mechanical and lack mental content; (3) they frequently arouse a distaste rather than a liking for physical exercise; (4) except for a few individuals they fail

to arouse permanent interests or develop self-sustaining habits; (5) they ignore or minimize the recreation element; (6) they lack the social and moral elements which are prominent in athletics and games; (7) as commonly taught to large groups they tend to ignore individual differences in physical endowment, acquirements, and needs.

All these objections may be raised against formal gymnastics as the sole or principal means of physical training. As a part of the program for physical training they have a legitimate place, possessing as they do, certain advantages which may not be found in athletics and games. Among those advantages may be mentioned the following: (*a*) properly administered gymnastics may be made an effective means of corrective training for individuals or selected groups of pupils; (*b*) their artificial character permits the selection of those exercises and only those exercises for psychomotor activity which make positive contributions to specific ends in physical training; (*c*) they may be made to combine certain æsthetic elements with physical training; (*d*) they may be made to include disciplinary elements; (*e*) they leave no room for the evils which always threaten athletics and games; (*f*) they permit organization into systematically graduated exercises which may readily be adapted to the demands of physiological development on the part of pupils.

309. Athletics, dancing, and games. While formally organized and officially administered physical training was struggling for a place in the work of the secondary school during the later part of the nineteenth century there was rapidly developing an extensive amount of informally organized and unofficially directed physical training through athletics and games in connection with the secondary schools. At first opposed by many school authorities, later accepted as a necessary evil, athletics and games have finally been welcomed at least as desirable auxiliaries to physical training. At present there is evidence that the stone which the builders rejected may become the head of the corner. One of the immediate needs of physical training in the secondary school is the harnessing up for effective training of those forms of physical activity which in athletics, dancing, and games so vitally hold the interest and provoke the endeavor of pupils.

Properly organized and administered athletics, dancing, and games offer opportunities for the development of a program of physical training and its coördination with other forms of education which no program of formal gymnastics can hope to accomplish. Reasons for this may be seen from the following considerations.

(1) For the normal secondary-school pupil physical training through athletics and games provides opportunity for motor activity which meets every aim of physical training as such much better than any form of artificial training. The movements of the body in athletics, dancing, and games are natural movements and have at least a temporarily definite purpose obvious to the pupil. In addition such exercises engage every important organ and part of the body and to a considerable extent they are carried on in the open air instead of in an enclosed, sometimes unhygienic, gymnasium.

(2) Athletics, dancing, and games, to a degree not paralleled by any other school exercise, unite phases of physical, mental, social, and moral education. In the majority of school studies social and moral principles are read about and talked about. In athletics and games they are learned through actual practice and by actual participation in the activities which call for their manifestation.

(3) In the greater part of secondary-school work the school must develop interests and endeavor. Athletics and

games have developed among the pupils to a certain degree spontaneously and through their native interests. Nowhere in the program of school work do we find such a firm basis of established interest.

(4) Physical training through athletics, dancing, and games offers an opportunity for the establishment of permanent health and recreation interests and habits. It thus becomes not merely a temporary expedient but an abiding instrument for health and pleasure.

(5) Educators are but beginning to recognize the important part held by play. Formal gymnastics ignores its importance. Athletics, dancing, and games make play the very basis of their appeal and value.

(6) Formal gymnastics as the principal means of physical training readily allows the subordination of educational needs to administrative exigencies. The organization of physical training on the basis of athletics and games forces the subordination of administrative exigencies to the real needs of physical training.

310. **Some dangers in such organization.** In the organization of physical training on the primary basis of athletics and games certain dangers must be guarded against.

(1) Properly organized and administered athletics and games may be made the basis of very effective social and moral education. Improperly organized and improperly administered they may become the means of harmful results in social and moral education. The price of gain is always the possibility of loss. The more effective an instrument is when properly employed the more dangerous it is likely to be when misapplied or carelessly used.

(2) A program of physical training through athletics and games must be prepared with great care. For girls in particular athletics and games in the secondary school where girls are in the pubescent or adolescent stages must be

organized with attention to their physical needs and conditions.

(3) A program of physical training based on athletics and games as the primary element presupposes proper provision for physical examination and care. In this connection it should be noted that physical training of any kind cannot be effective and may be actually harmful unless an effective program of health administration is established.

(4) Attempts to harness athletics and games to the regular work of the secondary school may easily result in the destruction of those spontaneous interests, enthusiasms, and endeavors which have made them such effective instruments for physical training (and for other forms of education) in the past when they were left more or less to the control of the pupils. In the organization of athletics as an integral part of the work of the secondary school, unless those spontaneous interests of the pupils can be preserved, there is danger that many of the advantages of athletics and games as forms of physical training may be lost.

(5) Closely related to the above is the problem of competitive interscholastic athletics. Many evils have undoubtedly developed around interscholastic contests and for that reason considerable opposition has been raised to their continuance. It should be noted, however, that interscholastic contests have been the principal factor contributing to the development of secondary-school athletics. No greater error could be made than to destroy the pupils' interest and coöperation in physical training through athletics and games by eliminating interscholastic contests.

311. **Military training and physical training.** The presence or imminence of war has always led to the consideration of military training as a part of the work of the secondary school. The predominant purpose of military training

is social and moral. Nevertheless it is to some extent related to physical training and is sometimes made a substitute for other forms of physical training. For convenience it may be considered in the present connection.

As a principal or sole means of physical training military training is unsatisfactory for the following reasons: (1) it is almost totally unsuitable for girls; (2) except as it includes forms of physical training not peculiar to military training it is limited in its scope for that purpose; (3) it cannot be required of all boys in the secondary school; (4) it does not capitalize the powerful instincts and interests of play and competition as do athletics and games; (5) its primary and fundamental aim is not physical, but social and moral, and those aims should dominate its instruction.

As a subsidiary means of physical education and as a means of social-moral education military training has legitimate claims for attention in the secondary school. Optimistic belief in the ultimate brotherhood of man and confidence in the ultimate elimination of militarism and war should not blind us to the fact that at present preparation for the social-civic duties of life includes preparation for the defense of our lives and of our institutions. This can never be wholly intellectual and emotional. It must also involve the physical. In military training, therefore, some opportunity is afforded for this necessary factor through the combination of social, moral, and physical elements which must be involved in adequate preparation for civic education.

PROBLEMS FOR FURTHER CONSIDERATION

1. In any secondary school make an investigation of the illnesses of pupils and absences due to illness.
2. In any secondary school investigate the amount and character of physical exercise engaged in by pupils for any given period.
3. Compare the systems of physical education in German, English, and American secondary schools.

4. Trace the development of gymnastics in the American secondary school.
5. Trace the development of athletics in the American secondary school.
6. Trace the development of military training in the American secondary school.
7. Trace the development of instruction in physiology and hygiene in the American secondary school.
8. Analyze the arguments for and against the separate and direct teaching of sex hygiene in the public secondary school.
9. Analyze the arguments for and against military training for boys in the public secondary school.
10. Analyze the evils of secondary school athletics. How may they be remedied?
11. Select one group of pupils from the highest quarter of any secondary-school class (as measured by school grades) and another group of pupils from the lowest quarter of the same class. Compare the amount of illness and absence because of illness in both groups.
12. Compare the grades received by pupils who have engaged in athletics and those received by pupils who have engaged in no athletics in any one year.

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CHAPTER XX

THE ORGANIZATION OF SECONDARY EDUCATION: CURRICULUMS

I. Historical and Comparative

312. Historical development of curriculums. The Latin grammar school of the American colonies, as elsewhere, provided a single inflexible curriculum for all pupils — a narrowly classical curriculum designed to prepare boys for college. No departure from that plan was made until the time of the academy with its introduction not only of different subjects of study but also of differentiated curriculums. Thus in the academy established by Franklin provision was made for a Latin school, an English school, and a mathematical school, to which was added later a philosophical school. Thus also we find a Classical Department and an English Department in the Phillips Academy at Andover in 1818. At least to the extent of somewhat separate classical and English departments and sometimes separate departments or schools for boys and girls, curriculum differentiation became common in the academy at a relatively early date.

At the beginning of the high-school movement the tendency toward differentiation was manifested not by offering different curriculums in the same school but by establishing separate schools for different groups of pupils. Thus we find the secondary-school system of Boston, which up to 1821 had consisted of the Public Latin School alone, enlarged by the establishment of the English Classical (High) School in that year and by the establishment of the Girls'

High School in 1826. A few other cities followed this plan. The high-school law of 1827 in Massachusetts tended to check the practice of establishing separate secondary schools for different groups of pupils and tended to establish public high schools in which somewhat differentiated curriculums were provided. The practice of providing separate curriculums or departments within the same school has been the usual practice almost from the beginning of the high-school movement. It is to be noted that the bases of differentiated curriculums, until well toward the close of the nineteenth century, were (1) separate courses for those going to college and those not going to college; (2) separate courses for boys and for girls, especially during the earlier period; and (3) toward the close of the century somewhat differentiated courses for pupils preparing for varying forms of higher education.

During the last quarter of the nineteenth century a number of factors combined to foster greater differentiation than had previously obtained in the organization of curriculums: (1) the increased differentiation in college admission requirements; (2) the increasing strength of demands for the recognition of newly developed subjects of study; (3) the extension of the patronage of the public high school and the influx of pupils with different interests, capacities, and probable future needs; (4) the demands of vocational education and practical-arts education, especially as related to manual, technical, and commercial training; (5) increasing recognition of the principle of "selection." These and other factors as early as 1890 caused such a lack of uniformity and so much variation in secondary education that a committee was appointed by the National Council of Education to render a report on the general subject of uniformity in school programs and in requirements for admission to college. As a consequence of the report presented by that committee in 1891 the National Education Association appointed a committee to continue the study of the matter in 1892. That committee (the Committee of Ten on Secondary School Studies) rendered a report in 1893 which practically dominated the curriculums of American secondary education for more than a decade and whose influence has not yet entirely ceased. The diversity of subject which had developed in the secondary school in 1893 may be seen from the fact "that the total number of subjects taught in the secondary schools was nearly forty, thirteen of which, however, were found in only a few schools."

313. **Curriculums recommended by the Committee of Ten.** The most important result of the work of the Committee of Ten was the formulation of four curriculums which were recommended as models for the work of the secondary school. Those curriculums were based on the list of subjects "which the Conferences deal with as proper for secondary schools." [1]

> They are: 1. languages — Latin, Greek, English, German, and French, (and locally Spanish); 2. mathematics — algebra, geometry, and trigonometry; 3. general history, and the intensive study of special epochs; 4. natural history — including descriptive astronomy, meteorology, botany, zoölogy, physiology, geology, and ethnology, most of which subjects may be conveniently grouped under the title of physical geography; and 5. physics and chemistry. The Committee of Ten assent to this list, both for what it includes and for what it excludes, with some practical qualifications to be mentioned.

On the basis of this list of subjects the committee suggested four curriculums — the Classical Course, the Latin-Scientific Course, the Modern Languages Course, and the English Course. For a complete view of the curriculums recommended the reader must be referred to the report of the committee. Some conception of the relative importance attached by the committee to the various fields of study may be gained from the figures presented in the following table:

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[1] *Report of the Committee on Secondary School Studies*, pp. 36–37 (Bureau of Education edition).

TABLE CLIII. CURRICULUMS RECOMMENDED BY THE COMMITTEE OF TEN IN 1893. PERCENTAGES OF TOTAL TIME DEVOTED TO SUBJECT GROUPS*

Subject groups	*Curriculums*			
	Classical (*per cent*)	*Latin-scientific* (*per cent*)	*Modern Languages* (*per cent*)	*English* (*per cent*)
English	13.75	16.25	16.25	21.25–20.00
Foreign language	48.75	36.25	36.25	21.25–22.50
Mathematics	13.75–17.50	13.75–17.50	13.75–17.50	17.50
Natural Science	11.25	22.50	22.50	22.50
Social Science	12.50– 8.75	11.25– 7.50	11.25– 7.50	17.50
Fine Arts	. . .	Not specifically	provided	. . .
Vocational subjects	. . .	Not specifically	provided	. . .
Physical education	. . .	Not specifically	provided	. . .

* Compiled from *Report of the Committee on Secondary School Studies*, pp. 46–47 (Bureau of Education edition).

314. Criticism of the committee's recommendations. In the light of present knowledge, theory, and practice it is obvious that the recommendations of the Committee of Ten are open to serious criticism. Without attempting a complete analysis of the recommendations we may note the following serious objections: (1) the almost complete failure to recognize the practical and vocational arts subjects; (2) the obvious dominance of the college-admission function; (3) the differentiation of curriculums on the basis of predominant subjects rather than on the basis of the activities of life to which pupils will apply their training; (4) the over-emphasis on the study of foreign language (required of all pupils and demanding from more than one fifth to nearly one half of all the time devoted to formal school work); (5) the failure to provide for those pupils who must leave school before the secondary-school course can be completed; (6) the relatively small amount of flexibility afforded; (7) the failure in other ways to provide curriculums well suited to the demands of individual differences.

In spite of all these defects the report of the committee did much to aid secondary education in the United States through the introduction of valuable standardizing agencies at a time when they were sorely needed. Ultimately, however, the curriculums proposed could not meet the demands of secondary education. The theory and practice of the past decade or more have tended to correct the obvious defects in the plans recommended by the Committee of Ten. The principles involved in the present tendency toward reorganization in curriculums are best considered analytically rather than historically and descriptively. They are considered in later sections of this chapter.

315. Suggestions from foreign practice. In Chapter VI an attempt was made to outline briefly the organization of curriculums in Germany, France, and England. Further consideration is here pertinent only to point out some special features which may be suggested for American practice.

(1) Secondary education in most foreign countries begins at an earlier age and stage than in the United States, commonly beginning at an age between nine and twelve and at a stage corresponding to a point between the fifth and seventh grades of the American school system. Differences in social organization and aims, in educational theory and functions, in a multitude of other factors, make it difficult, or even dangerous, to draw applications to American practice from practices in other countries. Nevertheless consideration of foreign practice suggests that in the organization of secondary education, and therefore of secondary-school

curriculums, we may safely consider at least two grades below the four grades now commonly considered.

(2) Vocational and practical arts education have developed far more rapidly and successfully in some European countries than in America. While it is true that vocational curriculums have developed in European countries apart from other forms of secondary education and in separate schools it is nevertheless true that greater provision has been made for vocational education abroad and that we may learn much from their practice.

(3) In most foreign schools more work is required of pupils than in the American secondary school. It is not improbable that in the organization of the curriculums more study than is required at present could be expected.

II. PRINCIPLES DETERMINING THE ORGANIZATION OF CURRICULUMS

Practically every factor and principle discussed in the preceding chapters of this book in some degree affects the determination of secondary-school curriculums. Some are so vitally involved that they deserve special attention here.

316. The aims and functions of secondary education. In Chapter X it was pointed out that every individual is destined to participate in three general forms of activity, and accordingly that secondary education has three fundamental aims: (1) the social-civic aim, involving the preparation of the individual as a prospective citizen and coöperating member of society; (2) the economic-vocational aim, involving the preparation of the individual as a prospective worker and producer; and (3) the individualistic-avocational aim, involving the preparation of the individual for participation in those activities of life which primarily concern the proper use of leisure and the development of personality apart from distinctly constructive social ends. Since every individual is at once a citizen, a worker, and a relatively independent personality, and since those three phases of his activity cannot be divorced, it follows that a fundamental principle in the organization of curriculums is the conception that each of the three aims mentioned must be recognized in due proportion and that no curriculum which ignores or minimizes any one of those aims can be acceptable. Two facts should be noted, however, (*a*) it cannot be assumed that studies in the secondary-school program can be distributed entirely according to the three aims suggested; e.g., English may well contribute to all three aims: (*b*) for some groups of pupils, e.g., those postponing direct vocational training until the period of higher education, vocational education in the secondary school must be conceived as indirect and propædeutic.

It was also pointed out in Chapter X that secondary education has certain "functions" or general lines of activity which it must follow if the aims above mentioned are to be attained. These functions have very important bearing on the determination of the curriculums.

(*1*) *The adjustive function* of secondary education demands that provision be made in the curriculums for media of training which involve fundamental principles, skills, etc., and suggests the limitations of curricula which involve only training for temporary present conditions.

(*2*) *The integrating function* of secondary education is on of the most important factors determining the establishment of essentially identical elements which should form a part of every curriculum. It is one of the basic principles suggesting the presence of certain subjects (especially English and social science) in every curriculum.

(*3*) *The differentiating function* is the basis on which rest different curriculums for different groups of pupils, varying elements entering into every curriculum to meet the needs of different capacities and aptitudes of different pupils engaged in that curriculum, and in general the adaptation of curriculums to individual differences among pupils and the differentiated needs of society.

(4) *The propædeutic function* demands recognition of the fact that certain forms of education are necessary for the successful participation in other forms of education which depend on them. Its special importance is found, of course, in connection with curriculums for secondary-school pupils destined to continue their formal education in higher institutions.

(5) *The selective function* emphasizes two important facts in connection with the organization of curriculums: (*a*) it suggests recognition of the fact that it should operate by differentiation rather than by elimination; (*b*) it demands recognition of the fact that the bases for curriculums vary noticeably in different grades of the school. Thus Table LXVIII indicates that pupils destined to go to some higher institution after the high school constitute one sixth of the entire first-year class, one quarter of the second-year class, one third of the third-year class, and one half of the fourth-year class.

(6) *The diagnostic function* demands recognition of the fact that in the organization of curriculums an attempt should be made to bring pupils into contact with a relatively wide range of subject-matter to the end that they may more intelligently and more effectively determine their own needs, interests, and capacities. It is, for instance, one reason for the introduction of "general" or "elementary" science in an early grade, and, possibly, for diagnostic "short-unit" courses in the junior high school.

317. **Principles arising from pupils' development.** In Chapters I and II an attempt was made to analyze factors

involved in the physical and psychological development of pupils and their bearing on secondary education. Certain deductions were drawn, some of which have important bearing on the determination of secondary-school curriculums. Of particular importance is the principle that the development of the pupil is essentially gradual and continuous without sudden and abrupt changes at any one point to justify radical changes in the curriculums. This principle suggests that in the organization of curriculums provision should be made for gradual transition from grade, with special reference to the transition from one division of the system to another. In this connection attention may be called to the following elements involved: (1) provision for close articulation between the last grades of the elementary school and the first grades of the high school and between the junior and senior high schools; (2) provision for the somewhat gradual introduction of "elective" subjects and the gradual expansion of the area of variable elements in the curriculums; (3) provision for the gradual introduction of "departmental" work; (4) provision for the gradual introduction of new subjects; (5) provision for the close correlation of subjects.

A second principle arising from the nature of the development of pupils is that the introduction of subjects is in a general way only related to the age of the pupils and that there is no justification in the theory which postulates that certain ages are especially suited to different subjects. For example, there is no established justification for the belief that subjects requiring a great amount of memorization should be introduced relatively early nor that subjects calling for logical reasoning should be delayed in their introduction. On the other hand the manner in which subjects are presented is very seriously affected by the stage of progress of the pupils. The factors which determine the appropriate times for the introduction of subject-matter are (*a*) the previous experiences and training of the pupils, and (*b*) social factors determining the use of education afforded. It is needless to say that the organization of materials and the methods of teaching must vary widely according to the grades in which the subjects are introduced.

318. Principles arising from individual differences. In Chapter III an attempt was made to point out the factors involved in the distribution of individual differences among secondary-school pupils. It was there shown that pupils differ widely in native capacities, acquired abilities, native and acquired interests, environmental conditions, and probable future activities. Recognition of this factor is the basis not only of differentiated curriculums but of greater or less variation within the limits of any one curriculum. Curriculum differentiation is determined primarily by the probable future activities of pupils, especially along vocational lines. Differentiation within any curriculum must be provided in order to meet still further the demands of individual differences in capacities, interests, and aptitudes.

On the principle that individual differences must be met as far as may be possible rest all the variable elements in the secondary school — curriculum "election," subject "election," promotion by subjects rather than by grades, provision for educational diagnosis, exploration, etc., provision for educational guidance (including vocational, social, moral, and avocational guidance), provision for economy of time in education, etc.

319. The distribution and classification of pupils. In Chapter IV it was shown that of pupils who enter the first grade of the four-year high school at the present time about one third leave before the beginning of the second grade, about one half are gone before the beginning of the third grade, about two thirds are gone before the beginning of the fourth year, and less than one third are graduated. Of those pupils who enter the seventh grade of the elementary school little more than one half reach the first grade of the high school, two thirds are gone by the beginning of the second year, about three quarters have left by the beginning of the third year, and few more than one fifth are left in the last grade of the high school. However conditions for the retention of pupils may be improved in the future, it must be recognized that the factor of elimination vitally affects the organization of curriculums in two important respects: (*a*) provision must be made by the organization of flexible curriculums, the introduction of varied forms of education, and the proper administration of the diagnostic function, which will encourage continuance in the secondary school longer of pupils who now leave school in large numbers;(*b*) provision must be made for an education as effective as possible, as appropriate as possible, and as well rounded-out as possible for pupils who must leave school before the completion of the course.

In Chapter IV also an attempt was made to classify pupils according to their probable stay in the secondary school and according to the character of the future activities of different groups. In Table LXVIII figures were presented showing for the country at large the proportions of pupils in the various grades belonging to different groups, classified according to their probable stay in the school. If the classification there made be accepted it follows that the following general groups of pupils must be considered in the organization of secondary school curriculums:

1. Those who will continue their education beyond the secondary school in some higher institution. This group is composed of those who will enter the "higher" professions and whose direct vocational education will be provided in the higher institutions. Under existing conditions this group consti-

tutes approximately one sixth of pupils in the first grade of the four-year high school, about one quarter of those in the second grade, about one third of those in the third grade and about one half of those in the fourth grade. It constitutes about one eleventh of those in the seventh grade of the present elementary school.

2. Those who will complete the secondary school course but close their formal education at that point. Boys and girls belonging to this group will or should enter relatively high grade occupations and should be provided preparation for those occupations in the secondary school. Their stay throughout the full school course permits well-developed curriculums which should be definitely directed toward the attainment of rather highly developed knowledge or skill related to some occupation, a well organized body of associated occupational knowledges and skills, toward the attainment of a satisfactory social-civic, and toward the development of worthy means of enjoying leisure. This group is of proportions in various grades of the school system approximately the same as were true of the previous group. Pupils graduated from the secondary school are about equally divided between those continuing and those not continuing their formal education.
3. Those who remain in school until the close of the eleventh grade but who leave school at that point. Pupils belonging to this group will for the most part engage in occupations involving knowledges and skills appropriate to agricultural, industrial, commercial, or domestic activities. The group constitutes (under present conditions) approximately one twentieth of the pupils in the seventh grade of the school, approximately one tenth of pupils in the ninth grade, about one seventh of those in the tenth grade, and about one third of those in the eleventh grade.
4. Those who remain in school through the tenth grade but who leave at that point. Their occupations will be much the same as those who leave at the close of the eleventh grade. The group constitutes (under present conditions) about one tenth of those in the seventh grade, about one fifth of those in the ninth grade, and about one third of pupils in the tenth grade.
5. Those who at present receive but one year (or less) of high-school education. Pupils belonging to this group must enter

occupations in the fields of agriculture, industry, commerce, or household work. For the most part they must be recruited into the trades and the curriculum organization must recognize that fact. The group constitutes about one fifth of those who are in the seventh grade, about one fourth of those in the eighth grade, and about one third of those in the ninth grade of the school.

6. Where the junior-senior high school organization is in operation there must be considered in the organization of curriculums the fact that about two fifths of the pupils entering the seventh grade never proceed (under present conditions) as far as the ninth grade. Curriculums must there be organized for the purpose of retaining those pupils at least through the ninth grade and for the purpose of providing curriculums as effective as possible for those who must leave at the close of the junior high school.

It is, of course, obvious that the distribution of pupils among the groups above mentioned is true for the country at large only and will not hold for individual communities. The importance to be attached to the different groups must vary with the character of the community and the secondary-school population. It is obvious also that the conditions at present obtaining will not remain constant but that with each improvement in the organization of the school system the proportions of pupils falling in any of the above-mentioned groups may be radically changed. Whatever be the conditions at any time, however, in the organization of curriculums attention must be paid to the expectancy of stay of different pupils in the school and their probable later activities.

320. **Constant and variable elements.** Certain subjects of study are of such universal value that they may legitimately find a place in practically every curriculum provided and be engaged in (under normal conditions) by practically every pupil at appropriate stages in the course, without regard for the special activities connected with particular

occupations. Such subjects may well be organized in the same way, cover the same field, and be taught in the same manner for all pupils in all curriculums. For convenience such studies may be termed "constants."

Other subjects of study in the secondary school are of such limited, contingent, or specialized value that they should belong to one of three groups of studies: (1) those found only in certain specialized curriculums; (2) those found in several or all curriculums but with certain modifications; (3) those not required of all pupils nor necessarily required in any one curriculum, but open to the free election by any pupil in whatever curriculum enrolled. The entire group may for convenience be termed "variables"; those in group (1) may be termed "curriculum specials," those in group (2) may be termed "curriculum modifiables," and those in group (3) may be termed "free electives." On the proper distribution of the constants and several variables to a great extent depends the success of curriculum organization. Suggestions concerning their proper distribution are presented in following sections.

321. **The determination of constants.** Two somewhat related yet separate factors determine the constants which should enter into the curriculums of the secondary school.

(1) Fundamental, universal, and direct values characterize some subjects of study. Thus, whatever be the special field of one's activities, certain elements of language use are fundamentally important. The development of ability to use language (the mother tongue) as an instrument for thinking and for the expression and interpretation of thought must be an aim common to all curriculums and must form a part of the education of every individual. Likewise social-civic-moral activities must be engaged in by all individuals and must, therefore, be a part of every curriculum in the secondary school. As a minimum this should include a study

of the history of the United States, civics, some elements of government, literature, and, in the junior high school, social and economic geography. In this group also must be considered health education, together with " general " or " elementary " science where one primary basis of its organization is the inclusion of such common scientific knowledges as enter into the activities of almost all individuals. Further, we must consider as belonging to this group of studies, particularly in the junior high school, such universally important elements of arithmetic, penmanship, spelling, and the like, as should be judged necessary for all and have not reached the proper stages of development in the lower grades. Finally, we must recognize, wherever possible, certain universal elements of æsthetic appreciation, e.g., musical appreciation and literature in the junior high school.

A second factor affecting the determination of constants is found in the integrating values attached to some studies, especially to the social studies and to the mother tongue and its literature. Fortunately for economy in education subjects of study which contribute most to this end are the same as some suggested by the values suggested in the preceding.

On the basis of such criteria we may suggest as constants in the curriculums of the secondary school the following: (*a*) English throughout the junior and senior high schools; (*b*) some social science in each grade of the junior and senior high schools; (*c*) health study throughout the junior high school in some form, physical training through exercise in all grades of the secondary school; (*d*) " general science " in the junior high school; musical appreciation in the junior high school. These should be considered as irreducible minima in the group of constants.

322. The determination of variables. Three important factors must determine the amount and character of the variables in secondary-school curriculums.

(1) Individual differences among pupils in capacities, acquired abilities, interests, and futures is the primary factor determining variables in secondary-school studies. To ignore their existence and the character of their distribution is to come directly into conflict with nature. Nevertheless dominant differences only can be considered, since the effective and economical administration of curriculums demands that a sufficiently large group of pupils having somewhat similar capacities, abilities, interests, and probable futures be afforded to justify the formation of classes for instruction in any subject. Within the limits of effective and economical administration the number and kinds of variables introduced into secondary-school curriculums should be as large and diversified as possible. Any subject of study which meets the needs of a sufficiently large number of pupils to permit effective organization of classes and which possesses educational value is justified in the secondary school.

(2) The differentiated needs of society demand that variable elements enter the curriculums of the secondary school. No single group of activities in life can justifiably monopolize the field of secondary education. Studies dealing with every important phase of life's activities should be represented in the program of the secondary school whenever they can be suited to the capacities of pupils and meet real needs on their part.

(3) The size of the secondary school and available means especially affect the secondary school variables. Differentiated education is directly conditioned by the number of pupils involved. In nine tenths of the secondary schools of the country the number of variables possible is reduced to a minimum by the fact that the enrollment is too small to permit differentiation and by the fact that financial assets are narrowly limited.

323. **Rigid *versus* flexible curriculums.** In the history of

the high school during the past half-century there is observable a tendency to swing alternately from the one extreme of rigidity in curriculum organization to the other extreme of almost entire flexibility and back again. During the early days of the high school curriculums were rather distinctly separated and permitted little overlapping or cross-cutting. During the latter part of the nineteenth century curriculums were rather loosely administered and in some cases all lines of curriculum demarcation were practically nominal. With the recent change in the basis of curriculum differentiation from subject-matter to individual needs and post-scholastic destinies there has developed a tendency to organize rather definitely separated curriculums which permit a relatively small amount of overlapping or cross-cutting. The advantages of exclusive curriculums are readily seen: (1) such a practice permits a much more effective organization of the work of different curriculums and its adaptation to special ends which are largely vocational; (2) it permits a more homogeneous grouping of pupils; (3) it permits the more effective direction of teaching; (4) as a result of those and other factors involved it permits the securing of better results as far as the special features of the different curriculums are concerned. The disadvantages of exclusive curriculums are no less obvious, however: (1) such a practice considers primarily differentiation according to dominant interests (largely vocational) and neglects other elements of differentiation, by delimiting the range of subjects which may be studied by pupils engaged in any one curriculum, thus reducing the flexibility of the school work; (2) it tends to introduce differentiation where advantages are small (sometimes dangerous) and disadvantages are great; (3) it presupposes a rather early determination of life interests and life careers; (4) it presupposes that interests remain fairly constant; (5) in nine tenths of the secondary schools of the country the rigid separation of curriculums is impractical if not impossible.

All things considered it would appear to be reasonable that curriculums should be characterized by a relatively high degree of flexibility in the early grades of the secondary school, by a relatively high degree of rigidity in the later grades, and by a gradual transition from the one status to the other. Such a practice would recognize in the early grades of the secondary school (*a*) the desirability of a relatively wide range of subject-matter favorable to educational diagnosis, prognosis, and guidance — themselves conducive to the possibility of greater definiteness in later work; (*b*) the desirability of not anticipating too much the decision of vocational or other choices; and (*c*) the desirability of permitting as much adaptation to individual differences as may be practicable. At the same time it would recognize in the later grades of the school the desirability of definitely determined vocational work, the necessity for specialization and concentration along definite lines, and definite propædeutic training for those whose education will continue beyond the secondary school. It would further recognize that in the later grades of the secondary school groups of pupils may more readily be classified and their special needs determined.

It should be recognized that the work of the last three grades of the secondary school should represent rather clear-cut and definitely directed training and in those grades the lines of curriculum differentiation may be fairly distinct. Before the beginning of the second year of the present four-year high school the rigid demarcation of curriculums is undesirable. In the first year of the four-year high school provision must be made for adaptation, diagnosis, and guidance and the curricula should be as flexible as possible. The primary functions of the junior high school (where the junior-senior secondary schools exist) preclude any rigid demarcation of curriculums, at least in the earlier grades. It is by no means improbable that formally separated curriculums are entirely out of place, though insistence must be placed on the widest possible variation in subject offerings. In general it may be said that provision for individual differences in the first six grades is for the most part restricted to differentiated teaching methods, that provision for individual differences in the junior high school should involve differentiated subject matter and teaching method, and that in the senior high school should be added definitely differentiated curriculums. However, from stage to stage in the system the transition should be gradual.

324. **Continuity and concentration.** One of the most common criticisms made by foreign observers of our secondary education and by our own citizens involves the failure to secure thoroughness and the tendency to foster superficiality. This is an ever-present danger where an attempt is made to adapt education to individual differences, where curriculums are flexible, and variables constitute important parts of curriculums. It must be recognized that a system of curriculum organization and administration which permits a scattering of units of study, allows the pupil to study a number of rather isolated subjects, to begin several studies without carrying any one of them beyond the introductory and elementary stages, to attain a smattering of many subjects with failure to learn any one of them thoroughly, is fundamentally wrong. To avoid such results it is necessary that limits be set to the variables which are found in any student's program. One way of accomplishing this is to require sequential or advanced work in some specified fields. A method better adapted to the demands of individual differences is to require that advanced work be done in some one or more fields with the selection of the field of

"concentration" dependent on the individual student. Thus a "major" may be required in some one of the fields not considered "constants" in the curriculums — natural science, mathematics, foreign language, fine arts, or the various fields of practical and vocational arts. At least one such major should be required of every "normal" pupil.

325. **Required, preferential, and elective subjects.** Educational practice in the past has commonly (*a*) made the completion of a prescribed amount of work of definitely specified character an absolute prerequisite for entrance to the secondary school, and (*b*) made an absolute prescription of certain subjects in the curriculums of the secondary school. As a result pupils in large numbers have been retained in the elementary-school grades long after they have ceased to receive appreciable benefit through the studies there offered, after they have passed far beyond the normal age for elementary-school grades, and after they have chronologically, physiologically, and socially grown far beyond the groups of pupils with whom they are associated. Inevitably this leads to undesirable retardation and ultimately to elimination before they have come into contact with any forms of education other than those of the elementary school. Doubtless admission to the secondary school must always be determined primarily by "pedagogical age." Nevertheless, this criterion should be supplemented by other criteria of chronological, physiological, and social age, and all pupils so mature chronologically, physiologically, or socially that they may benefit more by some forms of secondary education than by the limited offerings of elementary education, should be admitted to some form of secondary education. Such a practice necessarily means that no single subject of study of the secondary school can be considered absolutely and invariably "required." Hence "constants" in the curriculums must be considered as

"preferential" rather than "required." Here it is probable that some distinction must be made between diploma "requirements" and curriculum requirements. Limitation should not be placed on the courses of study which the individual pupils may take. Limitations involving "required" subjects must be placed on requirements for a diploma. For normal pupils "required" subjects are appropriate. For somewhat atypical pupils the absolute requirement of specified subjects cannot justly be made without the expectation of retardation, elimination, and loss of time, energy, and money. For the entire pupil group of the secondary school subjects of study which are considered of universal value must at best be considered as "preferential." For "normal" pupils certain subjects of study may well be considered "required."

In some ways it is unfortunate that the term "elective" has been applied to subjects of study falling in the group of "variables" — unfortunate because the term implies that the selection of "variables" can be or should be left to the judgment of the pupils for the most part. "Election" of subjects or of curriculums is peculiarly unfortunate where provision is not made (*a*) for training in the earlier grades which may provide a basis for intelligent selection, and (*b*) for educational guidance. A necessary accompaniment of differentiation in subject matter and in curriculums is provision for diagnostic training and educational guidance.

326. Immediate and deferred values. A glance at the curriculums proposed by the Committee of Ten discloses the fact that they assume the completion of the entire course on the part of most pupils entering the school and that the value of the first-year's work is largely dependent on later study. Recognition of the fact that large proportions of pupils must leave the secondary school after one, two, or three years of study demands that, as far as is possible, curriculums should be so organized as to subordinate deferred values to immediate values so that the maximum of benefit may be secured by those who must leave school early and at the same time that progressively greater benefit may accrue to those who continue. This is in part a matter of subject organization and teaching method, in part a matter of curriculum organization. The principle applied to the former factor suggests that in the earlier grades of the secondary school subject be organized and taught with special reference to the major and more important elements immediately applicable to the activities of life and more technical, specialized, and refined elements postponed to further study in later grades. Applied to the factor of curriculum organization the principle suggests (*a*) the introduction in early grades of some subjects specifically designed for immediate use by those who will leave school early; (*b*) the organization of such courses as " general " science, community civics, etc., in the junior high school grades for the distinct purpose of providing values immediately available.

III. CURRICULUM ORGANIZATION BASED ON PRINCIPLES SUGGESTED

327. Preliminary explanation of curriculums. It is obvious that the character of curriculum organization in the secondary school of any given community must be conditioned by the size of the pupil population, its character, and the resources of the school and community, so that it is impossible to determine any single curriculum organization which is appropriate *in toto* for all secondary schools. As a working basis the curriculum organization outlined below assumes a secondary-school population sufficiently large and sufficiently diversified to make possible the extensive offering suggested and sufficient resources to allow the organization and offering of any form of education for which there exists a reasonable demand and which the best educational theory can justify. By a process of elimination where necessary or desirable it is possible to outline the curriculum organization of any secondary school on the basis of the plan suggested.

The curriculum organization outlined below considers the school work of the six grades following six grades of elementary education. For convenience the organization is outlined on the basis of two three-grade divisions which would correspond to but not necessarily involve a three-grade junior high school followed by a three-grade senior high school. An examination of the organization outlined will show that relatively slight modifications would adapt the scheme to the eight-four system now commonly found, provided the work of the seventh and eighth grades were reorganized as suggested. The latter reorganization appears desirable whatever be the form of external administration and divisional separation.

In the organization outlined for grades seven, eight, and nine formal separation of studies into curriculums is purposely avoided on the ground that any organization of formally separated curriculums tends seriously to endanger flexibility, to encourage premature specialization, and to interfere seriously with the diagnostic and exploring function of the earlier grades. Failure to make a formal differentiation into separate curriculums is far from meaning that different groups of pupils will not pursue differentiated lines of work. The absence of curriculum names and classifications is designed solely to obviate the tendency for pupils to select special lines of work too early, to continue in whatever lines they may have entered through inertia, ignorance, or following the lines of least resistance, and to prevent the tendency of school officers permanently to catalog pupils in any category wherein they may once have been placed. Formal curriculum demarcation has no place in the early grades of the junior high school and for few groups even in the last grade. At the most definitely separated curriculums should be provided only in the last grade of that school and for those pupils only who will clearly leave at the end of the junior high school.

In the organization outlined certain studies are considered as constants to be studied by all pupils of normal progress and as studies required for the secondary-school diploma. It is to be recognized, however, that those mature pupils who have been admitted to the seventh grade without the successful completion of the regular work of the first six grades may be allowed to study any combination of subjects which their limited attainments, capacities, and interests may permit. Such pupils are to be considered as atypical, destined in the majority of cases to leave school before the completion of the secondary-school course, and entitled to receive at best certificates of the work which they have done rather than the diploma of the school, unless later work may justify their readmission to full standing.

328. **Curriculum organization for the junior high school.** Below are outlined two forms of curriculum organization which are suggested as possible schemes for the junior high school — grades seven, eight, and nine. Neither, of course, is to be considered as the necessary or even the most desirable form of organization. The sole purpose in presenting the two forms of organization is to illustrate possible ways in which principles previously considered may be applied.

Form I illustrates a possible curriculum organization for a junior high school where no provision is made for supervised study or combined recitation-study periods. The number of class meetings is assumed to correspond to present practice in the seventh and eighth grades, i.e., about thirty to thirty-five class meetings per week, the length of each period being approximately thirty minutes.

TABLE CLIV. CURRICULUM ORGANIZATION FOR A JUNIOR HIGH SCHOOL: FORM I

Grade 7		*Grade 8*		*Grade 9*	
Studies	*Periods*	*Studies*	*Periods*	*Studies*	*Periods*
Constants:		*Constants:*		*Constants:*	
English	5	English	5	English	5
Geography (3), history (2)	5	History (U.S.), civics	5	Community civics	5
Physiology and hygiene	3	General science	5	General science	5
Arithmetic	5	Mathematics: (A) combined arithmetic, algebra, geometry; *or* (B) commercial arithmetic	4	Physical education	2
Physical education	2	Physical education	2	Music (appreciation)	2
Music (appreciation)	2	Music (appreciation)	2		
Practical arts: domestic arts (girls); manual arts (boys)	5				
Total constants	27	Total constants	23	Total constants	19
Variables:		*Variables:*		*Variables:*	
English: various branches for those deficient	2	English: various branches for those deficient	2	Foreign language	5
Arithmetic: for those deficient	2	Foreign language	5	Mathematics	5
Foreign language	5	Fine arts	3	History	4
Fine arts	3	Music (technical)	3	Fine arts	5
Music (technical)	3	Commercial studies	5–10	Music (technical)	3
Commercial studies	5	Clerical studies	5–10	Commercial studies	5–15
Clerical studies	5	Industrial studies	5–10	Clerical studies	5–15
Industrial studies	5	Domestic studies	5–10	Industrial studies	5–15
Domestic studies	5	Agricultural studies	5–10	Domestic studies	5–15
Agricultural studies	5			Agricultural studies	5–15
Total variables	4–8	Total variables	8–12	Total variables	12–15

NOTES: 1. The numbers of periods set are merely approximations and intended to be suggestive rather than fixed.

2. The practical arts constant in the seventh grade may be made diagnostic "short-unit" courses if desired.

3. It is not expected that all schools, perhaps not any school, will provide all the studies listed under variables. The extended list is presented for selection according to the needs and resources of any given school.

4. It is expected that the more able pupils may pass directly from the eighth grade into the senior high school.

5. Definitely separated curriculums may be organized for special groups of pupils who will leave school at the close of the ninth grade, if that course appears justified.

Form II illustrates a possible curriculum organization where provision is made for combined recitation-study periods. The entire school day is assumed to be seven hours in length — one half-hour each day for assembly, opening exercises, music, and auditorium work, one half-hour each day for lunch, and six hours net (including time for changing classes) for class meetings, each period being one hour in length (inclusive of time for change of classes). The same program may be encompassed in a six-hour day where each period is made fifty minutes in length. The curriculum organization of Form I may be adapted to that of Form II with a few modifications in the number of periods assigned to some studies.

TABLE CLV. CURRICULUM ORGANIZATION FOR A JUNIOR HIGH SCHOOL: FORM II

Grade 7		*Grade 8*		*Grade 9*	
Studies	*Periods*	*Studies*	*Periods*	*Studies*	*Periods*
Constants:		*Constants:*		*Constants:*	
English	5	English	5	English	5
Geography and history	5	History and civics	5	Community civics	4
Arithmetic	5	General science	4	General science	4
Physiology and hygiene	3	Mathematics	4	Physical education	2
Physical education	2	Physical education	2		
Practical arts	5				
Total constants	25	Total constants	20	Total constants	15
Variables	5	*Variables*	10	*Variables*	15

NOTES: The notes appended to Form I (Table CLIV) apply here. The same studies as those in Form I are meant here. The variables are the same here as for Form I.

329. Curriculum organization of the senior high school. Detailed analysis of the curriculum organization of the senior high school in grades ten, eleven, and twelve is rendered very difficult in the abstract for a number of reasons: (*a*) the major part of the work of those grades should consist of differentiated studies involving many variables, the enumeration of which would be of little worth for any given secondary school; (*b*) the character of the variables must differ in different communities, especially with reference to vocational studies; (*c*) in the majority of secondary schools complete offerings are economically impossible and selections must be made rigorously; (*d*) the distribution of studies in grades ten to twelve must be dependent to some extent on the distribution of studies in grades seven to nine so that all possible combinations cannot be presented in any single and simple tabulated scheme.

The general form of curriculum organization in the senior high school may be readily outlined. By the beginning of the tenth grade it should be possible to group pupils for the most part into divisions according to their dominant interests, abilities, and destinies, at least in a tentative fashion. Curriculum differentiation, with definite though not exclusive lines of demarcation, should be possible and should be determined according to the dominant interests, abilities, and destinies of pupils. A somewhat comprehensive organization would then provide for the curriculum groupings suggested in this list.

(1) For those entering business and clerical occupations — the business and clerical curriculums, including the following more or less overlapping curriculums: (*a*) various forms of office and clerical occupations which emphasize such studies as bookkeeping, stenography and typewriting, correspondence, circularizing, filing, etc.; (*b*) merchandizing, selling, and store service; (*c*) any other group of business or clerical arts.

(2) For those entering industrial occupations — the industrial curriculums, including curriculums preparing for (*a*) building trades; (*b*) wood-working trades; (*c*) metal-working trades; (*d*) machinist trades; (*e*)–(?) any other industrial occupations desirable and practicable according to the needs of pupils and society.

(3) For those entering agricultural occupations — agricultural curriculums, including those involving preparation for (*a*) general farming; (*b*) animal husbandry; (*c*) – (?) special phases of agricultural work according to the needs of pupils and society.

(4) For girls entering domestic occupations and other

girls not enrolled in other curriculums — domestic curriculums, including those involving (*a*) preparation for housekeeping and home-making; (*b*) the preparation for nursing as a separate occupation; (*c*) the preparation of skilled workers in institutions calling for domestic and personal service. Some parts of these curriculums may well overlap industrial occupations in the textile and clothing trades.

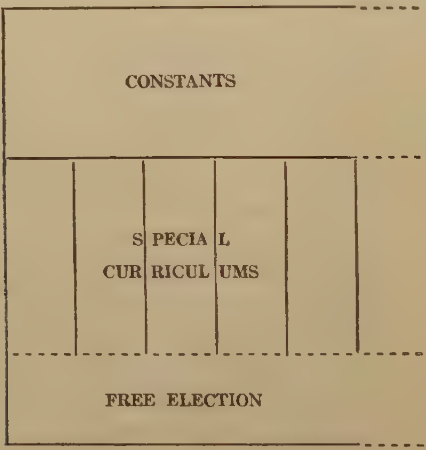
(5) For pupils entering higher institutions — preparatory curriculums including those preparing (*a*) for the academic college; (*b*) the technical or other special college; (*c*) the normal school.

(6) For pupils whose future activities cannot yet be determined with any assurance — the general curriculum. In this curriculum the basis of the selection of studies should involve fundamental and diagnostic forms of education.

(7) – (?) In some of the largest schools it is practicable to establish other special curriculums, e.g., for music and fine arts.

In all this curriculum organization it should be recognized that three "areas" are to be considered: (*a*) the area of constants; (*b*) the area of curriculum restriction; (*c*) the area of free election. The area of constants includes that portion of the work of the senior high-school work which is to engage the attention of all pupils of regular standing. Here belongs the study of English, social science, and physical training. The area of curriculum restriction includes that portion of the work of the senior high school which provides for the specialized education appropriate to the various special curriculums. The area of free election includes that part of the school work which should be left to the unrestricted choice of the pupil whatever special curriculum may engage his particular attention, save only in so far as he may not possess qualifications necessary successfully to pursue any study. While it is difficult to determine definitely the exact proportions which should be allotted to these three areas, it may be suggested that approximately two fifths of the total time should be devoted to constants in the curriculum organization, approximately two fifths to the coördinate studies of some one curriculum, and approximately one fifth to studies according to the unrestricted election of the pupil. These last studies may or may not be elected within the field of his special curriculum interest. Diagramatically the approximate distribution of these three areas may be represented as follows.

Figure W. Illustrating the General Form of Curriculum Organization in the Senior High School



PROBLEMS FOR FURTHER CONSIDERATION

1. Analyze the curriculum of the last two grades of the present elementary school. How does the existing curriculum compare with that suggested for the first two grades of the junior high school? (Cf. *Fourteenth Yearbook of the National Society for the Study of Education*, part I; *Sixteenth Yearbook*, part I.)

2. Consider the curriculum organization of the junior high school with reference to its diagnostic and exploring function.
3. Trace the influence of college admission requirements on the curriculum organization of the secondary school.
4. Compare the curriculum organization of higher schools in Prussia, France, and the United States.
5. What measures can you suggest to prevent scattering and superficiality in American secondary education?
6. What are the arguments for and against the absolute prescription of certain studies in all curriculums and for all pupils?
7. For any given community work out an ideal curriculum organization for its secondary schools.
8. How is curriculum organization affected by factors of retardation, acceleration, and elimination?
9. Trace the influence of proper recognition of the factor of individual differences on the curriculum organization of secondary schools.
10. Show the bearing of theories of development on the curriculum organization of the secondary school.
11. Analyze the influence of social factors on the curriculum organization of the secondary school.
12. Compare and criticize the curriculum organization of three actual secondary schools, one in an agricultural community, one in an industrial city, and one in a residential city.

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CHAPTER XXI

THE ORGANIZATION OF SECONDARY EDUCATION
(continued)

I. Some Phases of External Organization

330. **The place of the secondary school.** For the individual education is a unitary and continuous process which predicates no separate stages of elementary, secondary, and higher education except in the most general senses. For this reason a system of education which proceeded gradually and without points of abrupt transition would be the ideal. In such a system secondary education could be considered merely an indistinctly defined division which developed gradually out of an indistinctly defined elementary education and merged gradually into an indistinctly defined higher education. However, where children must be educated in groups the exigencies of school economy and efficient administration necessitate the organization of the school system into divisions which externally at least are more or less separate. Thus for younger pupils in the lower grades a large number of buildings must be provided, so situated as to minimize the distance to be traveled: for older pupils fewer buildings are required and distance is a matter of less importance. For younger pupils studies are relatively uniform: for older pupils differentiated education must be provided. For younger pupils the single teacher plan is possible and appropriate: for older pupils specialists in various fields are necessary and appropriate. These and numerous other factors sooner or later in the school system necessitate changes in educational procedure which require

special forms of school organization and result in administration divisions.

If it be recognized that the exigencies of organization and administration necessitate the division of the school system into two or more departments, the problem at once presents itself — At what point or points should the division or divisions come? In Chapter VII were adduced certain considerations suggesting that our present organization is faulty in many respects and that a better scheme would be as follows: elementary schools for children of ages approximately six to twelve (grades one to six) and secondary schools for pupils of ages thirteen to eighteen (grades seven to twelve), with an organization such as to provide junior high schools for pupils of ages approximately thirteen to fifteen (grades seven to nine) and senior high schools for pupils of ages approximately sixteen to eighteen (grades ten to twelve). Some of the more important considerations involved may be summarized briefly here.

(1) Pupils in grades one to six are predominantly immature physiologically: in grades ten to twelve they are predominantly mature: in grades seven to nine they are in a transitional stage as far as the factor of puberty is concerned. At the age of twelve less than five per cent of the pupils are post-pubescent: at the age of sixteen more than four fifths of the pupils are post-pubescent: ages thirteen to fifteen are markedly transitional ages as far as puberty is concerned.[1]

(2) Elimination does not begin to manifest its influence strongly until about the age of fourteen — the close of the compulsory attendance period in most States. In the school it becomes noticeable by the beginning of the sixth grade and is at present very strong in grades seven, eight, and nine. It is important that some of the phases of secondary

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[1] Cf. chapters I and II.

education be operative before the majority of pupils leave school.[1] It is also important that the broader field of secondary education should have an opportunity to exert its influence on the retention of pupils.

(3) Individual differences are manifest in all stages of education. They become greater and increasingly important as pupils progress through the grades. While there is no single point at which one may say that they demand special attention, it is probable that special consideration should be given that factor and special provision should be made as early as the seventh grade. Certain it is that such provision is now delayed too long. It is to be noted that effective provision for individual differences cannot be made unless fairly large total groups of pupils are involved. Provision for individual differences to the extent demanded by secondary education cannot be made effective in the ordinary elementary schools.

(4) Before the pupil enters on rather specialized education in the later grades of the system he should have some opportunity to try out and test his capacities and interests. Provision for such diagnostic education becomes an important function of the junior high school, leaving the major part of specialized education to the senior high school or, in some cases, to the college and university.

(5) The junior high school also provides for a possible somewhat rounded out education for those pupils who must leave school at an early date.

(6) Of the various forms of organization in the secondary school the "three-three plan" appears most desirable. Its most serious competitor is the "two-four plan." The latter plan is objectionable for several reasons. (*a*) It fosters the perpetuation of many evils which have grown up around the present organization. It is improbable that

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[1] Cf. chapter IV.

undesirable methods of teaching and of organization which have developed in connection with our present first-year work in the high school can be remedied as long as the existing organization of the high school is retained. (*b*) The break which is now in evidence between the eighth and ninth grades corresponds in time with the close of the compulsory attendance period. The "three-three" plan "straddles" that critical point to some extent and thus distributes eliminating factors. (*c*) The "two-four" plan does not correspond well with the factor of development at puberty.

One great danger threatens the success of the "six-three-three" plan — that through the organization of three departments in the school system education may lose unity and continuity. Throughout it must be kept in mind that administration should always conform as far as possible to educational demands rather than require that educational demands be subordinated to administration. This means that in the division of the system into three departments the greatest care should be exercised to avoid breaks in the education of the pupils.

Particularly important in this connection are problems of articulation between the elementary school and the junior high school and between the junior high school and the senior high school. It is imperative that the work of the seventh grade be carefully articulated with the work of the sixth grade. Promotion from the elementary school to the junior high school should be based primarily on pedagogical progress, i.e., the accomplishment of the work of the first six grades. This should be supplemented, however, by attention to other measures of maturity, e.g., chronological age, psychological age, physiological age, and social age. Regardless of pedagogical achievement a pupil so mature (mentally, physiologically, chronologically, or socially) that he can secure greater benefit from some phases of the junior high school work than from continuance in the elementary school, should be promoted arbitrarily to the junior high school. In general the same principle should be observed in promotion to the senior high school.

It has been suggested at times that the character of the junior high school work should be determined by the needs of those who will not go to the senior high school. Any such conception is totally unjustified. The junior high school should certainly provide an effective education for pupils who will not enter the senior high school. This cannot mean, however, that its responsibility for the education of those who will continue their education can be neglected. On the other hand, there is constant danger that the work of the junior high school may be determined by the demands of the senior high school. Important though the needs of those who are to enter the upper school may be, they cannot cause us to lose sight of the needs of those who must leave at the close of the junior high school. The character of the work of the senior high school must be determined by the capacities, attainments, and needs of the pupils who come from the junior high school. The senior high school must not dominate the work of the junior high school.

One of the weakest links in the system of education in America is the continuation school. In many communities no form of continuation education is provided at all. In communities which do make some provision for such education it is largely confined to "evening school" work. In many communities which provide evening schools the character of the work is so unsatisfactory that it scarcely deserves the name education. In 1914–15 communities of over 5000 population reported nearly 700,000 pupils enrolled in evening schools.[1] Probably less than 500,000 pupils actually attended evening schools for any appreciable period in that year. Compared with the number of boys and girls of ages appropriate for continuation education and not enrolled in the regular day schools that number is insignificant. Since attendance at school up to the age of about fourteen is almost universally compulsory in the country, it is clear that the greater part of continuation education (except for foreigners) must be of secondary character. In this country we have scarcely begun to recognize the importance of continuation education for those pupils who leave school early. In the reorganization of the school system definite and adequate provision must be made for the articulation of the junior high school in particular with forms of continuation education.

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[1] *Report of the United States Commissioner of Education* (1916), vol. II, pp. 232–38.

331. Comprehensive *versus* special-type secondary schools. The development of specialized curriculums for various groups of pupils in the secondary school has created this important problem in the organization and administration of secondary education — should secondary education be provided through comprehensive or composite schools in which all phases of the work are included in one unified scheme of organization and administration, or should it be provided through several special-type secondary schools, each restricted to a single curriculum or related group of curriculums? Within recent years there has been manifest a growing tendency in large cities to establish a series of special-type high schools, e.g., commercial high schools, technical high schools, industrial schools, •practical-arts high schools, and the like. With the development of the junior high school there has even been a tendency in some cities to establish special-type junior high schools. In Chapter XX the position was taken that the organization of clearly differentiated curriculums is out of place in the junior high school, except possibly for special groups of pupils who must leave school at the close of the ninth grade. If this contention be sound, it follows that special-type junior high schools cannot be justified. The problem reduces itself, therefore, to the present four-grade high school or the senior high school of the reorganized system.

First to be considered is the possibility of special-type high schools. In considering problems of secondary education in America no error is more common than that of assuming the large secondary school in a populous community as typical. The census of 1910 showed that there were 226 cities in the country having each a population of 25,000 or over, distributed as follows: 117 cities having a population of from 25,000 to 50,000; 59 cities having a population each of from 50,000 to 100,000; 42 cities having each a population of from 100,000 to 500,000 (the estimate for 1915 indicates 51); 5 cities having each a population of from 500,000 to 1,000,000 (the estimate for 1915 indicates 6); and 3 cities having each a population of over 1,000,000. Certainly cities having a population of less than 25,000 cannot consider the establishment of more than one high school of the present type or more than one senior high school, and few cities of less than 50,000 population can economically establish more than one such high school. One hundred cities would probably be a liberal estimate of the number of communities which might be able to establish systems of special-type high schools. Even then many of those cities could not establish more than two high schools. Any complete system of special-type high schools is an impossibility in all but a very few of the largest cities in the country. For the country at large the only possibility of a thorough-going system of special type high schools would be found in the total abandonment of local community schools and the development of a system of regional high schools. The most enthusiastic advocate of special-type high schools would scarcely recommend such a procedure. If further evidence is wanted, it should be supplied by the figures presented in Table XLIX. Those figures indicate that nearly eleven-twelfths of all the public high schools in the country are located in communities of less than eight thousand population each, those high schools having on the average from sixty to sixty-five pupils each.

The problem under consideration is thus limited to a few very large cities. It, therefore, remains to consider the relative advantages and disadvantages of comprehensive or composite high schools and special-type high schools in very populous communities. Among the principal advantages *claimed* for the special-type high school are the following: (*a*) the work of each school may be definitely directed along specialized lines; (*b*) more homogeneous groupings of pupils are possible; (*c*) various phases of the school work may be coördinated and concentrated on definite ends; (*d*) by bringing together all pupils engaged in one group of related curriculums more effective use of the school plant and the teaching force; (*e*) where vocational education is involved a higher degree of vocational interest may be developed in the special-type vocational school; (*f*) many matters such as the arrangement of the daily program, the assignment of rooms, and other elements of school machinery, may be more readily and more effectively administered in the special-type school; (*g*) in schools limited to special forms of education the school plant may be better adapted to the needs of special curriculums, especially where practical arts and vocational work require specially constructed rooms, special apparatus, and special organization; (*h*) by concentrating all special curriculum work in special schools such education is made more economical.

Among the principal objections to special-type secondary schools may be mentioned the following: (1) They tend toward a dangerous overemphasis on those special phases of education which form the basis of the special schools and toward the subordination of aims and functions not limited to special curriculums. (2) They tend to diminish the integrating function of secondary education by the separation of various social and vocational groups. In the past the social factor involved in the establishment of special-type schools has operated commonly to interfere seriously with the proper development of vocational education as well as with other forms of secondary education. (3) The establishment of special-type schools commonly leads to a reduction in the flexibility of programs and curriculums by lessening the range of variables in each school and by separating curriculums so that even the necessary and desirable amount of cross-cutting becomes impossible. (4) The effective administration of a system of special-type schools presupposes that real educational or vocational preferences determine the choice of schools by pupils or for pupils. As a matter of fact, many other factors affect the choice of school, some of which are quite irrelevant and may be antagonistic to real educational or vocational needs. Thus many pupils choose the high school which is nearest their homes, others the school to which their friends have gone or are going, others the school providing social attractions or having successful athletic teams. Hence in many cases the very purpose of the special-type high school is defeated by factors not readily controlled by school authorities. (5) Once such a choice of school is made, transfer to another school is relatively uncommon, however ill-adapted the work of the school chosen is to the capacities or interests of the pupil. No system of educational organization and administration can prevent a certain loss of time and energy when mistakes are made in the choice of educational offerings. However, where transfer from curriculum to curriculum is made difficult, as in the special-type school organization, the correction of original mistakes is rendered difficult. (6) Under a special-type high school organization it is assumed that dominant interests and aptitudes may be determined at an early age and that they remain essentially constant. Both assumptions are contrary to fact. With the establishment of a junior high school providing opportunities for diagnostic education and with an effective plan of educational guidance in operation, the situation may be improved. However, educational prognosis can never be perfect and for that reason flexibility in secondary-school organization and administration is imperative. (7) It is an axiom of education that attendance at school, especially where legal mandate is not operative, is in proportion to the accessibility of schools. The maintenance of special-type high schools necessarily increases the distance to be traveled by many pupils. This means much time lost in travel, much expense for that travel, and a decrease in the attracting power of the high school. In this connection it may be noted also that the interest of parents, of the pupils, and of the community in the school is lessened where schools are at a distance from the homes. (8) The economy claimed for special-type high schools is by no means established. Granted that the expense of operating such schools is economical as far as the school budget is concerned, there still remains the problem of expense to the pupils. On the assumption of two hundred days in the school year and a traveling expense of ten cents each day per pupil, the cost to parents per year per pupil becomes twenty dollars — a sizable fee for education in a free public school. If five hundred pupils are compelled to incur such expense because of the distance of the special-type schools the total added cost of education for that group becomes ten thousand dollars. The figures are, of course, merely illustrative, but they suggest the possibility that the economy of special-type schools is sometimes at the expense of pupils attending — a situation quite inconsistent with the conception of public education in America.

On the whole it appears: (*a*) that special-type junior high schools are unjustifiable; (*b*) that special-type four-grade high schools or senior high schools are practicable in a very few large cities only; (*c*) that the comprehensive or composite or consolidated high school should be the standard type even in the largest cities. The problem is closely related in all cases to the problem of the organization of vocational education considered in the following section.

In cities where two or more high schools are maintained it is not always possible to provide all curriculums in all schools, in as much as the number of pupils enrolled in some curriculums is so small as to render uneconomical separate groups in each high school. Here the lesser of two evils must be chosen and certain curriculums may be organized in one school only with provision for the attendance at that school of pupils from other districts who should be enrolled in those curriculums. The comprehensive or composite high school, however, should remain the standard type.

A somewhat analogous problem is involved in small country high schools. All desirable curriculums cannot be offered in every small high school. Effective organization would suggest that certain curriculums be offered in selected schools only and that provision be made for the admission to these schools of pupils from nearby communities whose needs require such specialized curriculums. The disadvantages of such a policy are obvious. It requires but little observation of rural conditions, however, to realize that the majority of such objections arise from the necessary limitations of high-school education in sparsely settled districts under any form of educational organization and administration.

It must be recognized that in the past special curriculums have not been well organized and administered in many comprehensive or composite high schools. The development of special-type high schools has been due in part to this fact. It should be noted, however, that the past and the present are but parts of a period of reorganization and experimentation in the field of vocational education. Even in specialized vocational schools education to date has been far from satisfactory. It should be noted also that the easiest path to reform in any special field of education is always through the isolation of that field and concentration on it. Immediate benefits, however, are not always ultimate gains and the shortest way through to a single goal is not always the best. No important reorganization can become effective in a day. The adjustment of modern education must take time and we shall be fortunate if important modifications in the school system become effective within a school generation. Nevertheless it must be recognized that the effective operation of the comprehensive or composite high school cannot materialize until (*a*) the various special curriculums within such a school are considered as entitled to equal opportunity and (*b*) each curriculum or group of related curriculums is organized and administered so as to make it effective and maintain its integrity. As long as our present system of curriculum organization and administration is maintained much of the effectiveness of secondary education will be jeopardized. The efficiency of the comprehensive or composite high school depends in no small degree on the proper organization and administration of its curriculums.

332. Organization of vocational secondary education. Within the past quarter of a century educational sociology has recognized the legitimacy and importance of the vocational-economic aim of secondary education. However, agreement as to its legitimacy and importance has been far more general than agreement as to its organization and administration. Here three major problems call for consideration.

(1) The first of these problems involves the relation between vocational education and other forms of education. Commonly this problem is considered as involving the relation between "vocational" and "liberal" education, sometimes on the assumption of an antagonism of those two forms of training. The indefiniteness and ambiguity of the term "liberal" renders it almost profitless to consider the problem in such terms. A better line of approach to the problem is that outlined in Chapters IX and X where it was suggested that the three fundamental aims of secondary education are the social-civic aim, the economic-vocational aim, and the individualistic-avocational aim — involving the training of the individual as a citizen, as a worker, and for the worthy use of leisure. Since each individual must participate in the three forms of activity implied in those aims and since to a considerable extent those aims overlap, all three aims must be recognized in the education of every secondary-school pupil. Hence the complete separation of vocational education can never be justified, and such statements as the following must be interpreted with care.

> I think the conviction is steadily growing that any form of vocational education, to be effective, must develop its own teaching processes as well as means of administration, and that on the whole, both as to methods of instruction and instruments of administration, it must be quite independent of general or so-called "liberal" education. This must be so because of the fundamental unlikenesses between the ends or purposes of liberal education and the ends or purposes of vocational education.[1]

Better stated is the following:

> From the standpoint of social economy it seems probable that the tendencies described above are wrong; that, for the sake of

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[1] Snedden, D., *Problems of Secondary Education*, p. 57.

integral development, all the valid aims of education should be kept in view during the entire preparatory period. Society demands that each adult, within the limits of his capacity, shall be physically well, shall be vocationally capable, shall have civic and moral insight and motive, and shall keep alive some cultural or æsthetic interests. But to insure this all-round development, it is essential that each part of it receive more or less continuous attention; it may well be doubted, for example, whether it is wise that a youth of sixteen should devote himself exclusively to any kind of vocational preparation, to the exclusion of all social and cultural interests; but there is also reason to suppose that much of our secondary education, which utterly ignores vocational considerations during the formative period, not less seriously handicaps its students.[1]

The real problem involved in the relation of vocational education and other forms of education concerns (*a*) the amount and character of vocational education to be provided and (*b*) the stage of the introduction of specialized vocational education. These considerations lead at once to the second problem of the organization of vocational education.

(2) Education in the elementary school up to the sixth grade and for pupils up to the approximate age of twelve cannot and should not be considered as involving vocational education in any other than an indirect way. By the beginning of the junior high school it is possible to make a start in "prevocational" education. Within the junior high school should be provided opportunity for some diagnostic education touching on vocational education in part, some vocational information of the "survey of vocations" type, and, for some at least, experience with the tools, processes, materials, and products of certain occupational fields. Here there is no place for highly specialized vocational training

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[1] Dutton, S. T., and Snedden, D., *The Administration of Public Education in the United States*, pp. 419–20. Quoted with the permission of the publishers, The Macmillan Company.

in processes. The acquisition of vocational outlooks, interests, and sympathies, the development of underlying knowledges and fundamental skills of a broad and general character, the beginning of education along lines which may later become specialized — these forms of vocational education are all that can and should be looked for in the junior high school. In all this, however, it should be recognized that concrete experiences, not book work and the abstract class recitation, must be the foundation of vocational preparation in the junior high school. First-hand contact with the concrete realities involved in the field of occupations is a necessity.

In the senior high school direct vocational education must be provided through some highly specialized curriculums. With proper organization of diagnostic education and "pre-vocational" training in the junior high school, a basis for effective direct vocational education in the upper school should be established. For some groups of pupils (practically all pupils whose education is not to be continued in the college or other higher institution) definite and specific vocational training looking toward the development of specialized vocational skill becomes an important desideratum in the senior high school, though other forms of education still have their proper place as suggested in Chapter XX.

The continuation school so neglected in American education should be given its legitimate and necessary place in coördination with the junior and senior high schools. Here again, while the function of the continuation school is by no means restricted to vocational education, that form of training assumes importance. In such a school vocational education should be of a definitely specialized character, aiming to develop occupational skill to a degree of efficiency which is marketable.

Vocational education, if it is to be really effective and warrant the attention of the school, must be related definitely and functionally with the occupational world for which it is designed to prepare. This means that it must be severely "practical," not "theoretical," that it must employ the actual tools, machinery, processes, and standards of the occupations, that training must be provided through teachers who are themselves experts with successful experience in their respective occupations, and that the training provided must involve first-hand contact with concrete experiences in the processes of the appropriate occupations. These considerations at once lead to the problem discussed in the following.

(3) One of the most difficult and most persistent problems of the organization of vocational education involves the question whether it can be provided best in special curriculums in comprehensive or composite high schools, in special-type high schools, or through coöperative part-time education. In the preceding section were considered the relative advantages of comprehensive or composite high schools and special-type high schools. It remains to consider the relative advantages and disadvantages of vocational education provided in the high school itself and vocational education provided through coöperative part-time education in which the pupil spends a part of his time in the occupation itself under the direction of the school and of the industrial officers. Here the most important factors involved are those discussed below.

(*a*) Vocational education in the high school itself must always be limited to a relatively small number of the more important occupations and to relatively few phases of activity common to special parts of those occupations. In many smaller communities it is all but impossible to provide any effective program of vocational education in the high schools because of the small numbers of pupils with widely varying vocational needs and interests. The range of coöperative part-time vocational education is limited only by the occupations found in the community and the possibility of securing effective coöperation on the part of those controlling the occupations.

(*b*) Most forms of vocational education in the high school are very expensive, mistaken attempts on the part of school officers to make vocational courses "pay for themselves" to the contrary notwithstanding. In many high schools the authorities deceive themselves and the public through ridiculously absurd bookkeeping and inventories. Industrial courses in particular are very expensive. The original expense for equipment is great, the cost of materials consumed and in many cases wasted is high, and the constant repair and replacement of equipment are expensive. In this connection it should be noted that effective industrial education cannot be afforded unless machinery and other equipment are kept "up to date." In the progressive factory of to-day much of the machinery is "scrapped" about every ten years and depreciation is reckoned at the rate of about five per cent the first year and much larger proportions thereafter. Much of the equipment in the high school is in use but a small portion of the time so that overhead expense is very great. The expense of vocational secondary education can be reduced to a minimum through a system of part-time coöperative work wherever such a system is possible. Further, part-time coöperative education makes possible some forms of vocational training whose expense would otherwise be prohibitive. In all this problem it should be recognized that ordinary estimates of the cost of vocational education in the high school are very untrustworthy, in part because of failure to account properly for depreciation of equipment and for other overhead charges, in part because the returns through the sale or use of products are grossly overestimated.

(*c*) In a paragraph above importance was attached to the necessity of relating vocational education as closely as possible to the occupations for which it is designed to prepare. It is very doubtful that this can be done effectively as long as vocational education is confined to the high-school building, though much may be accomplished where it is carried on through "projects." Through coöperative part-time education emphasis is placed on first-hand contact with the work-a-day world of actual occupations, practice is stressed instead of theory, industry is real not simulated (or dissimulated), and the vocation is learned in a real vocational atmosphere. Here, however, some distinction must be made between various forms of vocational education. Some forms of clerical work, some phases of agricultural education, some forms of household-arts work may be carried on with a fair degree of effectiveness under ordinary high-school conditions. Other forms of those same branches cannot be provided effectively without first-hand connection with the occupations themselves. Industrial education in particular is very difficult, if not actually impossible, in isolation from real industry.

(*d*) The slow development of coöperative part-time vocational education and the restriction of vocational education to the high school itself are due largely to the relative ease with which vocational education may be partially organized in the high school and the difficulty of organizing and administering coöperative education. The crux of vocational education is found in its organization and administration. The special difficulty of coöperative education, even where those who control factories, stores, and other occupational enterprises are ready to coöperate, lies in the fact that those who control and are responsible for education cannot exercise any degree of control over the vocational situation and for that reason cannot assure satisfactory vocational education. Obviously any appreciable degree of control over the vocational situation itself can neither be expected nor desired. Coöperative part-time vocational education must always rest on a somewhat precarious footing, dependent for its success or failure on conditions which lie beyond the control of the educational authorities. In addition, extensive administrative machinery is necessary for the effective supervision of coöperative part-time education and this fact sometimes limits the value of other benefits suggested in preceding paragraphs.

On the whole it appears desirable that such forms of vocational education as can be provided equally well or nearly as well in the school as in the occupation itself under part-time arrangements would better be provided in the school where supervision and direction can best be controlled, e.g., much of the clerical arts. Where it seems that the immediate contact with actual work-a-day conditions are more important, e.g., in much of the industrial work, coöperative part-time vocational work should be provided wherever local conditions make such coöperation possible and beneficial. In this it is probable that much more should be done than is now attempted. It should be observed, however, that great care must be exercised in the organization of coöperative part-time education and that it should never be attempted except where definite binding agreements can be made with those responsible for occupational enterprises. The high school undertakes a great responsibility when it entrusts an important part of the pupils' education to commercial enterprises. Education must not be exploited by industry.

II. Some Phases of Internal Organization

333. The organization of instruction. While detailed analysis of the instruction to be provided in the secondary school as far as teaching methods are concerned lies outside the scope of this book, a few important matters are so intimately related to the effective organization of secondary education that they deserve brief consideration here.

(1) In the past the materials of high-school subjects of study have been organized and taught according to the demands of the studies as logically organized fields of knowledge. In the reorganization of secondary education problems of subject organization and teaching methods must be approached from a different point of attack. The primary criteria of subject organization are (*a*) the psychological demands of the learning process as determined by the mental development and previous experiences of the pupils, and (*b*) the demands of the activities of life in which the pupils will utilize the various elements of their education. This does not necessarily mean that all subjects will lose their logical organization. What it does mean is that whether or not any given subject will be so organized and taught is to be determined by the more fundamental considerations mentioned. In some cases the entire organization of materials and methods must be changed. In other cases subjects will be organized and taught much according to the best practice of the present. In all probability the desirable form of education in the junior high school will demand radical reorganization of subjects of study in such a way as to emphasize elements most likely to prove of value to individuals in the commoner activities of life. The greater specialization of education in the senior high school will permit and justify the somewhat comprehensive and logical

organization of subject-matter with appropriate teaching methods emphasizing intensive study in special fields.

(2) Closely related to the matter considered in the preceding paragraph is the matter of immediate and deferred values. The tendency of secondary education in the past has been to emphasize deferred values at the expense of immediate values, to emphasize in the organization of materials and teaching methods values which depend for their manifestation on education continued throughout the school or extended over a period of years. We are beginning to realize that pupils in large numbers leave school before the close of the full course and that for them the subordination of immediate to deferred values means decided educational loss. As at present organized many subjects are of little value to the pupil unless he studies them for several years. Such studies must be reorganized and taught so that their usefulness begins for the pupil at the start and becomes of progressively greater value as they are studied longer. The much-maligned "general studies" have distinct value in the earlier grades of secondary education, i.e., in the junior high school.

(3) One of the most promising of recent reforms in secondary education involves the reorganization of classroom instruction in the form of combined recitation, teaching, and study. The term applied to the newer form of classroom instruction — "supervised study" — is in many respects a title unfortunately chosen. A better term would be "supervised learning." In brief the plan involves increased time allotted to the class meeting, with provision for "study" under the direct supervision of the class teacher. Introduced at first for the primary purposes of providing opportunity for study under favorable conditions and of affording opportunity to train pupils in the art of study, it bids fair to revolutionize the class meeting into a vastly more effective

instrument of education. Its advantages are numerous: (*a*) it reduces the amount of study to be done outside of the school where conditions are frequently such as to render effective study impossible; (*b*) it provides for study under the most favorable conditions during school hours by bringing the pupils' study under the direct supervision and guidance of the class teacher; (*c*) it affords an opportunity for the teacher to train pupils in effective methods of study both as related to learning in general and as related to specific studies; (*d*) it makes possible more effective provision for individual differences among pupils of the same class; (*e*) it makes possible the transformation of the class meeting from a period largely devoted to testing to a period devoted to real instruction; (*f*) it makes possible an effective distribution of the time to "recitation," the presentation of new material, and study; (*g*) it permits the "checking up" of the work of the pupil at every step in the learning process, thus practically eliminating the necessity for testing pupils during the class "recitation," making dishonest work all but impossible, and enabling the teacher to give aid at the point where aid is most needed. The possible disadvantages of the plan are: (*a*) the increased length of the school day necessitated; (*b*) the probable necessity for a slightly larger teaching staff; (*c*) the possibility of a somewhat increased cost arising from those two changes; (*d*) the danger that teachers may fail to recognize the real objects to be attained and permit mechanization of the class meeting to defeat the purposes of supervised learning: (*e*) the danger that teachers may aid the pupils to such an extent as to diminish the stimuli for initiative, responsibility, and independent work. The disadvantages are slight and the dangers are amenable to effective supervision. In the junior high school particularly "supervised learning" affords a means for a gradual transition from extensively supervised and rather dependent work of the elementary school to work demanding a greater degree of independence, responsibility, and initiative in the senior high school.

334. The organization of extra-curriculum education. The secondary school has constantly tended to draw a sharply dividing line between education through the curriculum and education through various activities which have developed in connection with school life apart from curriculum demands. This tendency to isolate the two fields of education cannot be justified. Properly organized and directed the extra-curriculum activities of the secondary school can be made instruments of education by no means inferior to many phases of the work included within the curriculum proper. Athletic and other games, musical organizations, debating societies, class societies, the various social organizations of the school — all these and other forms of extra-curriculum activity can be so organized as to make important contributions to the social-civic, the economic-vocational, and the individualistic-avocational aims of secondary education. In some schools they have been correlated so closely with parts of the curriculum as to form an integral part of secondary education. In other schools they are regarded either as necessary evils to be discouraged or as side issues which curriculum demands must constantly combat. Fortunately secondary-school authorities are beginning to recognize the peculiar educational possibilities of extra-curriculum activities and the necessity of welding the formal and informal activities of school life into a system of integrated education. Thus an advance step is taken in coördinating and unifying the experiences of the educand and in breaking down the barriers between the school and life.

Several educational possibilities are found in extra-curriculum activities to a degree not approached by the majority of curriculum activities. Among those possibilities may be emphasized the following: (*a*) The majority of extra-curriculum activities have developed from strong spontaneous interests which the school needs, not to arouse, but only to utilize and direct. (*b*) Social training through actual participation in coöperative activity is an essential element in most forms of extra-curriculum education. This element is at a minimum in most curriculum work. (*c*) Extra-curriculum activities greatly extend the field of avocational education. (*d*) Experience has shown that interest in certain forms of extra-curriculum activities can do more than any other one factor to unify the pupil body of a school.

Athletic clubs, walking clubs, and the like, afford some of the most valuable opportunities for physical education and should be closely correlated with curriculum demands for physical training and hygiene. Magazine clubs, the school paper, the dramatic club, the debating club, and similar activities afford valuable opportunities for training in English and should be closely coördinated with the English courses. Musical clubs of all sorts should become parts of the school work in music. The social-civic and moral ends of education find educational opportunities of great value in all forms of extra-curriculum activities wherein participation in coöperative enterprises plays a part. The individualistic-avocational aim of education finds opportunities in all extra-curriculum activities. Even the economic-vocational aim of education is not without some opportunities in this field, e.g., through musical organizations the school paper, the dramatic club, etc.

Beyond question secondary education should encompass the extra-curriculum activities and, as far as possible, bring them within the scope of secondary-school organization. However, two somewhat opposed dangers must be guarded against: (*a*) the danger that the strong spontaneous interests of extra-curriculum activities may lead to their overemphasis; (*b*) the danger that, in our attempts to harness extra-curriculum activities and control them for educational purposes, we may destroy the very interests which have given those activities some of their greatest value as educational instruments. If these two dangers be guarded against extra-curriculum activities may be made some of the most powerful instruments of secondary education.

335. **Educational diagnosis and guidance.** Doubtless educational diagnosis, prognosis, and guidance have always played some part informally in the organization of secondary education. Doubtless too all education may be conceived in some senses as involving a measure of diagnosis, prognosis, and guidance. However, definite plans for the organization of those phases of education only within recent years have invited the attention of educators, stimulated thereto by the changing character of the school population, by changes in educational theory, and by such social changes as were outlined briefly in Chapter IX. The movement received its first great impetus along the line of vocational guidance in the endeavor to provide a better means of adjustment between vocational capacity or aptitude and vocational opportunity, between the individual and his occupation, between the school and occupational life. As the movement developed two facts became clear: (*a*) that from the viewpoint of the school at least vocational guidance is but one phase of educational guidance, which in its broader sense includes vocational guidance, moral guidance, social guidance, avocational guidance, and educational guidance in the narrower sense; (*b*) that all educational guidance is primarily and fundamentally a matter of providing a wide variety of educational contacts and experiences so organized as to meet the needs of individual differences and to afford a basis of actual experience for the intelligent selection of

vocation and avocation, for the determination of moral and social conduct, and for the wise choice of educational offerings. The older conception of guidance involved primarily a system of educational advice (in some cases what practically amounted to educational compulsion) with particular reference to the selection of a vocation. The newer conception of guidance involves primarily a system of educational experiences designed to permit the pupil to explore, try out, and thus gain some understanding of his own capacities, aptitudes, and interests, to open up to the pupil's view the opportunities of life and of education, and, as far as possible, to make him acquainted with the privileges, demands, and responsibilities of life in its various phases, vocational and avocational, social, civic, and moral. Only when such a basis of experience is provided can any system of guidance by advice be safe or effective.

The diagnostic and directive function of education is important at all stages. Specially important, even critical, however, is the stage of education covered by the secondary school, and in particular by the junior high school. There the point is approached where children must leave school in large numbers, dominant interests, sometimes evanescent, sometimes permanent, develop rapidly under the increasing influence of the outside world, pupils must prepare some for immediate entrance into occupations, others for the rather specialized work of the senior high schools, and numerous other factors call for diagnosis, prognosis, and guidance. Hence it is that in the junior high school special attention must be paid to the organization of education in such a way as to lay a basis for educational guidance along the lines suggested above. This means: (*a*) the widest possible range of educational offerings suited to the maturity of pupils, opening up as many fields of life's activities and of educational opportunities as possible, and testing every important capacity and interest of pupils; (*b*) such methods of teaching, forms of organization and administration, as may contribute to the diagnostic and directive function of education; (*c*) opportunity for gradually increasing concentration in some fields looking forward to specialization in the senior high school or in some cases toward direct entrance into life; (*d*) the organization of certain courses primarily on the basis of their diagnostic and prognostic possibilities, e.g., "survey of vocations," and possibly coördinated "short-unit" courses; (*e*) an effective form of administrative machinery for educational guidance through advice, counseling, and possibly occupational placement.

336. **The social organization of the school.** The American democracy depends for its existence and success on the social consciousness and social coöperation of its citizens. Unless the school can make a significant contribution to the development of social consciousness and social coöperation it must fail in one of its most important purposes. In the endeavor to make that contribution great responsibility must rest on the secondary school wherein is trained that somewhat select group of individuals who must ultimately exert the greatest influence on our social and civic life. There three important fields of opportunity are found for training to social consciousness and social coöperation: (*a*) in certain studies of the curriculum and in the socialized recitation; (*b*) in many of the extra-curriculum activities of the school; (*c*) in the government or control of the pupil body. Of these three fields the first two have already been considered. The third deserves special consideration here.

The traditional methods of governing the pupil body have been those of rule and authority on the part of school officers and obedience to rules and submission to authority on the part of pupils. There can be no question that ultimate authority must always rest with the school officers. Neither can there be any doubt that in many respects secondary-school pupils are far too immature to exercise complete control over their own actions in the life of the school. Any unlimited "student self-government" scheme is foredoomed to failure. The failure of many honestly attempted "student self-government" plans and of many fraudulent plans masquerading under that title testify to its impracticability. Nevertheless it must be recognized that there is only one way to acquire social-coöperativeness and that is through social coöperation, that there is only one way to learn how to control one's conduct and that is through meeting the responsibility for that conduct, that there is only one way for groups to attain the ability for self-government and that is through actual participation by the group in its own government. Socially conscious and socially coöperating American citizens cannot be developed through the school unless in the school those citizens are trained through actual participation in the coöperative activities of the school. Self-governing American citizens can be developed only through some degree of exercise in actual self-government. The secondary school cannot and should not avoid its responsibility in this important form of education.

The emphasis above laid on training in self-government through self-government should not lead to the conclusion that the control and discipline of the pupil body in the secondary school can be left to the pupils. It should, however, lead to the conclusion that from the beginning of education in the lower grades and in increasing degree throughout the school responsibility for various forms of self-government should be placed on the pupils themselves as fast as it may appear that they are able to bear the burden successfully. It should also lead to the conclusion that wherever possible and as far as possible the coöperation of pupils, teachers, and administrative officers should be encouraged in the pupil government of the school. In no other way is there afforded any warrant or hope that the secondary school can make its proper contribution to the development of that social consciousness and social coöperation necessary for the existence and success of our American democracy.

PROBLEMS FOR FURTHER CONSIDERATION

1. What are some of the means which may be employed to minimize the educational disadvantages of administrative breaks in the school system?
2. Make a comparative study of the organization of secondary education in two cities of somewhat similar character in general but having one a system of comprehensive or composite high schools, the other a system of special-type high schools.
3. Make a survey of the possibilities for coöperative part-time vocational education in any community.
4. What are the arguments for and against specialized vocational education in the junior high school?
5. What means can you suggest of providing greater opportunities for secondary education in rural districts?
6. Make a comparative study of continuation schools in the United States and in Germany, France, and England.
7. Analyze the evening-school situation in the United States or in any one State.
8. What changes in the articulation of secondary and higher education would be necessitated by the organization of a junior-senior high-school system?
9. Show how the extra-curriculum activities of the secondary school might be more effectively developed.
10. For any secondary school analyze the changes which would be necessitated by the introduction of a system of supervised learning.
11. Make a study of various plans which have been elaborated for the organization of vocational guidance. (Cf. Brewer, J. M., and Kelly, R. W., *A Selected Critical Bibliography of Vocational Guidance.*)
12. Make a study of schemes for "student self-government" in secondary schools.
13. What are the arguments for and against an undivided school system of twelve grades?

SELECTED REFERENCES

Note: References given in previous chapters cover most of the problems considered in this chapter. To those references may be added the following which deal with educational guidance and with supervised learning.

I. Educational guidance:

Bloomfield, M., *Youth, School, and Vocation.*

Bloomfield, M. (Editor), *Readings in Vocational Guidance.*

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